1-1-2021

ECONOMIC DEVELOPMENT POLICY AND ECONOMIC GROWTH IN THE AMERICAN STATES

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A Dissertation
presented in partial fulfillment of requirements
for the degree of Doctor of Philosophy
in the Department of Political Science
The University of Mississippi

By
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August 2021

ABSTRACT

The American states routinely adopt various economic development policies but those policies do not always contribute to economic growth in the state. Scholars identify several reasons to explain why the policies do not always work. First, policies that do not address market demand; rather, provide economic incentives to bring inward industrial investments do not contribute to economic growth because the cost it takes to create jobs by such industrial recruitments is too high. Second, policies that are adopted out of inertia chosen from traditionally practiced policies do not work because they are not evaluated for their effectiveness in terms of meeting the current and future market demand. Third, policies that are adopted because neighboring or ideologically congruent states adopt them do not work because the appropriateness of a particular policy may not be the same in the pioneer and the follower states. These reasons imply that economic development policies that are not new enough to meet the current market demand, that are not helpful to promoting in-state entrepreneurship, that are designed to help out-of-state firms in extending their branch-plants, and that are inappropriate in terms of the home conditions can be ineffective for economic growth. I conduct empirical testing to examine these four expectations and the results suggest that innovative economic development policies, entrepreneurial policies, and policies that are congruent to the state's industrial strength lead to economic growth, but policies that are meant for industrial recruitments lead to leakage from the state's economy.

DEDICATION

To my daughter, Raoha Tashrif

ACKNOWLEDGEMENTS

I would like to thank Dr. Jonathan Winburn, the chair of my dissertation committee, for his guidance and care throughout the process of completing the dissertation. I also would like to thank the members of my dissertation committee, Drs. Robert Brown, John Bruce, and Joseph Holland, for their scholarly insights brought into my dissertation.

I would like to mention the support of Social Science Research Lab (SSRL) at the University of Mississippi in procuring data on economic development policies from The Council for Community and Economic Research (C2ER). My sincere thanks for the support goes to Dr. Winburn, the Director of SSRL. I would also like to thank Mr. Tom MacComb, Bureau of Economic Analysis (BEA), for his correspondence and explanation of the computational procedure of state-level economic leakage.

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CHAPTER 1

INTRODUCTION

Many scholars challenge the classical economics' position that economic growth depends on natural endowment, labor pool, and monetary and fiscal policies (e.g. Easterly and Levine 2003; Porter 1990, 2003). Rather, as some scholars argue, industrial productivity that results from continuous innovation and upgrading determines economic growth (e.g. Porter 1990). Political factors are associated with this innovativeness and economic growth because of two human agencies – institutions and human capital (Easterly and Levine 2003; Gourevitch 2008). While legal institutions can lead to economic growth by providing legal support in business transactions and property rights (North and Weingast 1989), political institutions such as state legislatures can facilitate superior economic and social outcomes because competition among the office seekers pushes them to adopt better policies (Berkowitz and Clay 2012). Human capital that is characterized by higher education and skills can also lead to economic growth by adopting new scientific and technological means (Mokyr 1990). A government, therefore, plays an important role in promoting innovation and economic growth by offering institutional supports and funding education and training.

More specifically, economic growth requires government policies in sorting out how capital investments will take place, and how efficiency in production will be maintained

(Bensel 2000). In the United States, while the federal government deals with monetary policy, and makes sure of non-interference with the market, the states and local governments are actively involved in influencing the business environment and human capital by adopting and funding various economic development policies (Jensen and Malesky 2018). Among those policies, there are entrepreneurship-oriented policies that help businesses with developing technical abilities and incentive-oriented policies that provide financial assistance to lure inward industrial investments. Scholars find that entrepreneurial policies lead to in-state economic growth because they promote using technology to utilize local resources and because they help to increase local capital (Langer 2001; Turner 2003). On the other hand, the economic incentives are ineffective for economic growth, and they are detrimental to innovation and a competitive business environment because they are meant for targeted firms or branch plants that may bring the capital back to where they originate from (Jensen and Malesky 2018; Langer 2001; Porter 1990; Turner 2003). Yet, many states keep offering economic incentives to lure inward investments, but why do they keep offering such incentives even if they do not contribute to economic growth?

There are electoral reasons for the politicians and there are systemic reasons for the state government to keep providing incentives. Incentivizing to recruit firms creates immediate effects in the electoral campaign of politicians by helping them to claim credit for creating jobs (Jensen and Malesky 2018; Turner 2003). The systemic reasons include an inertia factor for which the states keep doing what they have been doing and an emulation factor for which they tend to adopt policies that other governments (state, city, or the federal) adopt (Gilardi and Wasserfallen 2019; Gray 1973; Jensen and Malesky 2018; Turner 2003). For states are laboratories of democracy, a successful policy adopted by a state is followed by other states and similarly, an

unsuccessful policy is avoided (Karch 2007). However, in the process of the evaluation of policies as to whether they are successful or unsuccessful, the follower states might take too much time and become slow to adopt the innovative policies. Therefore, policy innovation and the diffusion of policies from one state government to another might play a role in economic growth. Walker (1969) finds a correlation between policy innovation and the state's richness but, to my knowledge, there is yet no empirical examination whether the rate, time, and pattern of policy diffusion have any impact on economic growth of a state. So specifically, I examine if the innovation and the process of policy diffusion has any impact on economic growth. In other words, my question is whether the governments that are more behind in adopting innovative policies also fall behind in economic growth.

Although a fast adoption of successful policies can positively impact economic growth, states make policy choices based on politicians' own interests, which markedly influence the course and speed of policy diffusion. Policy diffusion at the intergovernmental level happens through four mechanisms: learning from success and failure elsewhere, competition for resources such as industrial jobs, coercion for international/national pressure, and emulation for perceived appropriateness of policies (Gilardi and Wasserfallen 2019). Policy contents are often misjudged or wrongly applied at the issue definition and policy adoption stages. At the issue definition stage, policies are not always taken for their effectiveness, rather for politicians' perception of the merit of the policy (Boushey 2010; Gilardi and Wasserfallen 2019). At the adoption stage, politicians adopt policies that are congruent to their own ideological position and that have electoral consequences in their reelections (Gilardi and Wasserfallen 2019; Karch 2007; Walker 1969). In both stages, state's policy adoption is also influenced by the policy measures of the neighboring states (Walker 1969; Wang 2018). However, the states that pioneer the adoptiont of

a new policy can be more economically prosperous than the ones that follow the experience of the pioneers (Walker 1969). With the most upgraded/innovative policies, the pioneer states can support their competitive industries more effectively because surviving the competition requires industries constantly developing their products and production processes (Porter 1990; Porter 2003). Similarly, the states that are slow to adopt new policies fail to remain competitive, and consequently, remain slow in economic growth.

How can we characterize innovative and traditional policies? Can they effectively contribute to a state's economic growth? States adopt three main types of economic development policies: demand side or entrepreneurial policies, supply side or industrial recruitment policies, and deregulation or business climate policies. Generally, only demand side policies are found to contribute to economic growth (Langer 2001; Leicht and Jenkins 1994). Demand side policies such as research and development and export promotion contribute to the economy and decrease income inequality because they advance technology, increase capital, and encourage development to meet the demand of home and out-of-state markets (Jansa 2020; Langer 2001; Leicht and Jenkins 1994; Porter 1990). Demand side policies are innovative because they are adopted quickly in order to address the constant changes in demands. Being innovative, the demand side policies can lead to economic growth of the own state because they help product development and industrial processes in the home state to remain competitive to respond to the changing market demands. In contrast, supply side policies such as corporate, excise, income/property, and sales tax incentives do not bring economic growth but inequality because these policies are aimed at luring targeted out-of-state firms. The cost of these incentives becomes very high because firms' location decision is subject to bidding among multiple states (Jansa 2020; Langer 2001; Turner 2003). Moreover, economic incentives can be wasteful

because firms make location decisions for fundamental economic reasons to optimize input cost, transport cost, scale economies, shared resources, access to information, etc. (O'Sullivan 2011; Porter 1990; Turner 2003). So, supply side policies that are made to serve branch plants and their existing technologies are emulant ones and may not contribute to economic growth of the own state because the revenue the out-of-state firms generate becomes a mobile capital and get leaked from the economy of the host state.

Moreover, states may need industry specific economic policies because not all states specialize in the same industrial sector. For instance, in terms of employment size of an industry, Texas ranked first in the oil and gas production and transportation in 2017 while New York ranked 28th, whereas New York ranked 2nd in the biopharmaceuticals sectors in the same year but Texas ranked 10th (U.S. Cluster Mapping 2020). How does the government play a role in maintaining the level of competitiveness and innovativeness of the economy that a state specializes in? With incentivizing firms, governments insulate them from the pressure to compete with foreign companies (Porter 1990). So these firms become slow to innovate and eventually fail. Again, leaving everything on the market, including the promotion of entrepreneurship, is also harmful because then companies tend to merge or create alliances to monopolize the market, which also eventually hinders innovation in industries in the home state/country (Porter 1990). However, entrepreneurial projects do not help the politicians to claim credit because their impact is neither immediate nor as visible as the industrial recruitment projects' (Turner 2003). Again, a competitive industry takes decades to create the necessary agglomerative forces in a geographical region; but in politics, a decade is a very long time. Although politicians have limited incentives to make policies that support long term entrepreneurial programs, suitable entrepreneurial policies specific to the type of industry can

lead to an organic development of the business enterprises that may help the specializing industries in the home state to grow and to remain competitive in the out-of-state markets.

This dissertation empirically tests whether policy innovation and quick adoption of innovative policies lead to economic growth. I hypothesize that they should because innovation and a quick adoption thereof happen to address a new market demand; and meeting the market demand can lead to economic growth. I also test whether entrepreneurship- and incentive-oriented policies cause differing impacts on economic growth. I hypothesize that the former should positively and the latter should negatively impact in-state economic growth. I expect so because entrepreneurial policies support the local economy to grow from within and the revenue the economy creates is reinvested within the state; whereas, incentives bring external firms to take place of local businesses and allow locally generated revenue to move elsewhere for further investment preventing the in-state growth. Finally, I test whether policies specific to a state's industrial specialization cause any positive impact to the economic growth. I hypothesize that they should because a specialized industry can have a competitive advantage in the market and growth of such an industry means growth of other local related businesses, and growth of local businesses should lead to economic growth of the state.

The following chapter, Chapter 2, discusses in detail the theoretical aspects for the relations between economic growth and innovation, diffusion, entrepreneurial programs, and policy congruence with the industrial specialization. Chapter 2 also discusses why incentive-orinted programs may lead to economic leakage. Chapter 3 empirically examines how innovation and diffusion influences economic growth. Chapter 4 also empirically presents the influence of entrepreneurial and incentive-oriented programs on economic performance. Chapter 5 also emipirically examines the influece of policy congruence in terms of a state's industrial strength

on economic growth. Finally, Chapter 6 concludes with presenting some limitations and a summary of the findings and contributions of this dissertation.

CHAPTER 2

ECONOMIC GROWTH AND GOVERNMENT STRATEGIES

This chapter looks into the factors of economic growth and the strategies that governments engage in to improve economic performance. I examine this by first looking at comparative, cross-country studies and then focusing on the economic development among the American states. To establish the case for the American states, I first discuss the nature, purpose, and agents of the economic strategies adopted in the 50 states. Economic development strategies in the American states involve providing financial assistance to the businesses and sometimes to communities to help develop businesses and the business environment. These strategies are adopted in order to primarily boost economic growth by creating jobs, providing worker training, and providing financial and technical services to product development and innovation. A state governor's office principally coordinates the programs associated with economic development policies.

This chapter discusses the theory in detail for the questions presented in Chapter 1. In order to answer whether innovativeness is a factor of economic growth, I discuss how innovation is an essential component for the survival in capitalistic market competition (Cox 1995). Innovativeness creates a competitive advantage in the market and thus leads to improved economic performance (Porter 1990; Walker 1969). To answer the second question, whether

types of the policies matter to economic performance, I discuss why entrepreneurial policies should improve the business environment in the state and why incentive-oriented policies may lead to revenue leakage from the economy. Entrepreneurial programs develop a potential base in the community to grow entrepreneurs who are more likely to reinvest within the economy (Langer 2001; Leicht and Jenkins 1994), unlike out-of-state investors who are more likely to move the revenue from the host-economy to another location. Incentive-oriented programs that support inward investments often neutralize the home advantage of the local entrepreneurs and provide external investors a competitive advantage. Thus, with incentive-oriented programs, external investors replace home businesses (Turner 2003) and move the revenue out of the state. Finally, I discuss how policies congruent with the industrial strength of the state may lead to economic growth. A specialized industry consists of propulsive firms that are innovative because they deal with concurrent market demand (Glasson and Marshall 2007). Such an industry also grows other related businesses. Together they form a cluster and contribute to economic growth. If economic development policies focus the cluster, they should lead to improved economic performance (Porter 1990, 2003). This chapter finally discusses the variables and operationalization to test these theories empirically.

2.1 Factors of economic growth

Cross-country studies that look into variation in economic growth chiefly examine the factors of geography, institutions, and macroeconomic policies. On the geographic factors, studies that look into latitude find that tropical countries exhibit lower economic growth than the temperate countries because of low fertility of soil, dearth of supply of water, short summer days, hot and dry weather, etc. in the tropical regions (Sachs and Warner 1995). Land lockedness, over

dependence on particular commodities, unavailability of a trade route (especially marine), germs, type of crops (mainly unavailability of grain crops) are some of the other geographic factors that scholars find responsible as initial conditions that affect economic growth (Easterly and Levine 2003). However, many scholars challenge the independent role of the geographic factors and argue that geography shapes the institutions, which may cause the variation in economic growth (Acemoglu, Johnson, and Robinson 2001; Engerman and Sokoloff 1994). This view suggests that European colonialists formed extractive institutions where disease environment prevented settlement (e.g., Guyana) (Acemoglu, Johnson, and Robinson 2001) or scale of economies in crop production necessitated a slave-based economy (e.g., Brazil) (Engerman and Sokoloff 1994). The colonialists formed democratic institutions in areas where they could settle, and such areas were characterized by having controllable threats of germs (e.g., Australia, United States) (Acemoglu, Johnson, and Robinson 2001) or prevalence of small family farms that did not necessitate a large involvement of labor (e.g. North America) (Engerman and Sokoloff 1994).

On macroeconomic policies as a factor of economic growth, some studies find that, increase in money supplies increase economic growth (e.g., Fischer 1979). However, that may be possible for a period of downturn but in regular economic situations, inflation and much variation in monetary supply negatively impacts economic growth (Barro 1976; Kormendi and Meguire 1985). Therefore, like geographic factors, macroeconomic factors also do not independently cause economic growth; rather, it is the institutions that may impact economic growth by leveraging geographic advantages and regulating macroeconomic policies.

Cross-country studies are useful for establishing an understanding of factors that explain varying economic growth; however, the results do not perfectly offer an explanation of cross-state variation within a country. In the United States, states are party of a federal system in that

they are connected to each other based on mutual interdependence, and they maintain a free flow of goods and commodities (Hendrick and Garand 1991). Again, as Berkowitz and Clay (2012) argue, variation in initial conditions in terms of occupational homogeneity and legal systems influenced the political competition in legislatures and independence in the courts of the American states which ultimately impacted the economic growth of the states.

2.2 Economic development strategies in the American states

The government undertakes various economic development policies to boost economic growth by facilitating secure business transactions, by providing necessary resource and infrastructural support, and by ensuring a favorable business climate. The federal government makes monetary policies, supports business transactions, and provides funding to local governments (Feldman, Lanahan, and Lendel 2014). The federal grants are meant for education, training, transportation, infrastructure, community, and regional development that help directly or indirectly improve the business climate of state and local governments (Dilger and Cecire 2019). However, state governments are principally involved in all other activities to promote economic growth, while local governments like cities takes care of the public living environment by conducting public works activities. States essentially regulate how businesses are conducted, support business promotion, and facilitate development of human capital among others. State's functions also include control of banks, insurance, labor, and taxes.

There were historically four waves of economic development actions in the states (McMillan 2012). The First Wave occurred from the 1920s through the 1960s, when a great deal of investment happened in highways and transportation, communications, and ports among others. The Second Wave involved smokestack chasing – investing with one major industry that

can create big employment opportunities – during the 1960s and 1970s. In the 1980s, the Third Wave happened which included searching markets, factory-university collaboration, setting up industry clusters, and finding partnerships. The Fourth Wave, starting in the 1990s, involves finding foreign investors, and export promotion in foreign markets.

Scholars also group state's economic development policies in a number of other ways. Bartik (1991) describes some 'traditional' and 'new wave' incentive-oriented policy tools. Some examples of 'traditional' policies are marketing industrial sites, financial incentives like tax abatement and loans, and non-financial incentives like infrastructural provisioning and regulatory assistance. Some examples of 'new wave' policies are government loans, equity programs, export assistance, education for small businesses, research, and the use of hi-tech. Leicht and Jenkins (1994) do a factor analysis and group all of a state's economic development strategies into three categories: entrepreneurial programs, industrial recruitment programs, and labor control programs (Table 2.1). Entrepreneurial strategies are to help investors with startup finances and technological training. Industrial recruitment includes both investing in infrastructure in order to reduce cost of production (factor cost) of industrial products and providing direct incentives like subsidies and tax abatements to lure new industry. Industrial recruitment programs are also known as incentive-oriented programs. Thirdly, labor control programs include adopting right-to-work laws in order to discourage unionization and thereby improving the business climate of the states.

Table 2.1: Most common strategies of economic development in the American states listed by Leicht and Jenkins (1994)

Entrepreneurial Programs	Public venture capital programs
	Business incubators
	Technology assistance centers
	Research and technology parks
	Technology and managerial
	Assistance programs
	Research and development tax credits for high-technology industries
	Technology grants
	Technology transfer programs
	Customized labor training for high-technology industries
	Export promotion programs
Industrial Recruitment Programs	Direct state loans and loan guarantees
	Financing for existing plant expansion
	Revenue bond financing
	Tax abatements for land and capital
	Tax exemption on manufacturers' inventories and equipment purchases
	Accelerated depreciation tax credits
	Sales tax exemptions on equipment and raw materials
	Job creation tax credits
	Tax incentives for industrial investment
	General research and development tax credits
	General job screening and training programs
	Private development credit corporations
	Industrial parks
	Enterprise zones
Labor control programs	Right-to-work laws
	Absence of state minimum wage law
	Absence of state fair employment law
	Reduced workmen's compensation taxes
	Relaxed environmental regulation

2.3 The agents of state's economic growth

Given the fiscal ability, the state government, as the main actor, undertakes economic development policies to improve the state's economic growth. Among the national, regional, and state components that may impact economic growth, Hendrick and Garand (1991) find that the state's role is the most dominant (explaining 75% of variation in economic growth after the late

1960s). Regional and national components also play a role. In the early 1960s, the national components are found to explain 23-28%, regional components 5-6%, and state components 61% of the variation in economic growth (Hendrick and Garand 1991). While many states may have fiscal constraints, all states have access to sufficient information resources to help them with making economic development policies.

In order to make these policies, modern states do policy research using their own staffers and external sources. After the Supreme Court's ruling in 1960 for population based representatives in state legislatures, policy analysis has become important to the state governments to better serve their people (VanLandingham 2018). Now states' legislative branches and executive branches have their own staffers for policy research. External think tanks like universities also help states with policy research. Government led analyses are also readily available at the policy makers' request. Although states have their own research to make policies, the problem is that such research may not be a reflection of the true reality. Their own research can be biased by the desire of the policy makers (VanLandingham 2018). External think tanks can do independent research but they may not be relevant to the requirement of the states. However, policy makers can also get information from research intermediaries who do large scale research in the US. Overall, the state governments have sufficient resources to make informed policy decisions unless they are constrained by time or electoral considerations (Karch 2007).

On the federal level, the functional aspects of federalism determines a great deal of involvement of actors from the federal government and state government with a state's economic activity (Inman and Rubinfeld 1997). A confederate federalism is one proposed by Montesquieu, which ensures more representation but less economic efficiency. A compound federalism

advocated by Madison is one which is more centralized in nature but offers better economic efficiency. At the beginning of the Union, the federal government had a relation with the state governments based on dual federalism characterized by the separation of functions of each government, which moved to cooperative federalism afterwards, and again to coercive federalism, and finally to a mix of all three types (Geer, Schiller, and Segal 2014; McMillan 2012). This relationship produces varied outcomes of economic development policies for the states. For instance, in terms of dual federalism, interstate commerce is under the authority of the national government, and intrastate commerce under the states. If we ask whether the federal government can regulate a company doing business in multiple states, the answer is no, so long as the businesses do not affect interstate commerce. More specifically, if the business is a local activity such as a sugar refinery, the federal government cannot regulate the business even if the local refinery is a branch of company that does business nation-wide. In 1895, the Supreme Court ruled against the federal government stating that it cannot regulate the sugar refining business of the company (E.C. Knight Co.) because manufacturing by a company located in a state was under intrastate commerce (*United States vs. E.C. Knight Co.*) (Geer, Schiller, and Segal 2014). However, if the local business is a part of the business chain across multiple states, federal government can act to regulate the monopoly (*Swift & Co. vs. United States*).

Still, a company with multiple branches in multiple states can develop a monopolistic capability in the overall national market using their technical ability and innovations, to the least. With this kind of monopolistic market competition, problems arose when concentration of wealth happened in several regions. The national government, consequently, wanted to reduce the inequality by taking welfare projects such as the ones under the New Deal. In order to fund the welfare projects, Congress attempted to regulate the industry by its power to lay and collect

taxes but the Supreme Court ruled those regulations unconstitutional by the reference of the 10th amendment. Therefore, not only the nature of federalism but the ruling of Supreme Court also plays a role influencing the economic activities across the states.

Moreover, there is a principal-agent relationship at work in the process of fund disbursement among federal politicians and federal agents, and federal agents and local politicians (Chubb 1985). Federal politicians can control/monitor the funding process in two ways: first, by their expertise and power (e.g. oversight committee membership) and second, by their power to select grantees among the whole set of potential grantees based on ideology, constituency type, etc. At the same time, federal leaders can help state business in a number of ways: by setting meetings with out-of-state business leaders, by establishing universities in the states, by altering regulations, by setting up foreign trade zones in the states, etc. (McMillan 2012).

The likelihood of receiving federal grants increases when interjurisdictional cooperation among geographically proximate county, city, township governments within the metropolitan regions of states happens (Bickers and Stein 2004). Positive externalities for spillover effects are the reason why interjurisdictional cooperation may lead to more efficiency (Bickers and Stein 2004). Highway construction or joint river management, for instance, requires joint grant application and requires neighboring governments to share information and resources. Usually coordinated by Congressional representatives, the joint applications increase the chance of receiving federal grants. The projects that have a geographic specificity is more likely to receive these grants than projects without geographic specificity. Bickers and Stein (2004) find that an additional interlocal agreement per 10,000 people has a chance of winning 0.48 new grants and $27,655 in grant money for spatially specific projects, and 0.27 new grants and $1,215 in grant

money for spatially non-specific projects. They also find that individual need and demand based applications have a lesser chance of winning projects than applications that reflect interlocal cooperation. However, jurisdictions with Congressional representation from two parties are less likely to do interlocal cooperation than that from the same party.

States also directly work with governments of cities and counties. In fact, cities are more connected with state governments than the federal government (Agranoff and Mcguire 1998). State and cities work interdependently: State legislatures, various state agencies, such as transportation or environment, are the ones that the cities work with the most (Agranoff and Mcguire 1998). Cities are also equally well connected with interlocal agencies and partners. However, the nature of connections depends on the definition of the economic/physical development and interdependencies thereof based on the nature of the projects and financial aspects. Mostly the mayor or city manager leads all economic development activities done within the intergovernmental context. With this leadership, the agents of economic growth is a growth coalition in cities consisting of local government, utilities, banks, and property capitals (Cox 1995). Within interlocal agencies, cities closely work with chambers of commerce, development corporations, and private capital owners (Agranoff and Mcguire 1998).

2.4 Why does the government engage in economic development activity?

The government in the United States engages in economic development activities to attain more economic success. In order to determine how the capital investments will take place, and how the efficiency in production will be maintained, economic development requires government policies (Bensel 2000). Since the late 19th century, the federal government has maintained policy regulations to ensure capital mobility across local and foreign markets, free

interstate commerce, and an unregulated business climate (Bensel 2000). These federal policies shape a great deal of economic policies, activities, and growth at the state and local level. Following the adoption of these policies, the U.S. economy started booming in the early twentieth century with agriculture and automobiles. As an innovative sector, the U.S. automobile started to dominate world business in the early twentieth century (Kurth 1979). After World War II, the U.S. continued to gain access to foreign markets for local commodities and also invested in foreign countries such as in the automobile industry in Europe (Kurth 1979). However, following World War II, in order to maintain economic efficiency both in the local and export markets, and to provide better services to citizenry, the federal, state, and local governments adopted various economic development policies to modernize and professionalize the economic activities in the states of the United States.

As a capitalist economy, three elements have shaped the economic development activities in the US since the late 19th century: protection for the industry, conservative monetary policy, and an unregulated market (Bensel 2000). Bensel (2000) argues that the Republican Party acted as the agent of economic development in the late 19th century. He also argues that tariff policy was not required for economic reasons to protect local industries from foreign competition but was required to form a popular coalition for the Republican Party. The gold standard as a conservative monetary policy and an unregulated labor and production market have been required for economic reasons. By maintaining consistency with international price of gold, the economy can maintain a consistent exchange rate for capital investments. By ensuring a free interstate commerce and an unregulated business climate in terms of unionization and environmental matters, the economy can maintain efficiency in the industrial production. Bensel (2000) also argues that a class-oriented force for redistribution of wealth was not successful in

the US and that capital accumulation for persistent investment was possible here. In order to appease the class cleavage, a broad coalition of industrial workers, farmers, and financial elites was necessary. In the US, during late 19th century, the Republican Party, the Supreme Court, and Congress could enable all these three conditions for economic development. A cross-class coalition was possible for the tariff policy, which has remained under Congress. An unregulated market was possible for the Supreme Court rulings that have maintained preventing any blockage from free flow of interstate commerce. Finally, the gold standard for the international market was maintained by the treasury department under the executive branch in order to facilitate a proper exchange of capital transfer across industries and across the states in the United States until early 1930s (Bensel 2000). Although the gold standard was abandoned in 1933 and so was completely in 1971, the treasury has maintained facilitating a stable exchange of capital money using the dollar. With that, the dominance of dollar in the international market has provided the necessary conditions for U.S. industries to compete in the export-markets, influencing the economic development activities in the various states.

At the state level, industrialization, natural resource management, and key human development activities have been the most important economic development activities. Each state competes to lure industry and mobile capital. In order to remain competitive, states adopt various economic development polices (discussed above). However, economic development at the state level centers on the cities in the states. City governments' economic activities influence the competitiveness of the state as a whole. However, in particular, the literature, known as New Urban Politics (NUP), holds that cities engage in economic development activities for structural reasons (Peterson 1981). Local governments basically engage in economic development activities in order to deal with fiscal stress as a structural process (Peterson 1981; Wolman and

Spitzley 1996). NUP discusses politics of competitions and power relations for inward investments for fiscal management and economic development of cities and communities (Cox 1995). Cities seek inward investments for projects like metropolitan shopping malls, gentrification of downtowns, airline hubs, and so on. So, cities, like private companies, constantly upgrade their standings by adopting growth policies (Peterson 1981). Other studies hold that the adoption of economic policies is contingent on fiscal conditions (Bowman and Pagano 1992). But why would external investors prefer one city over another from the list of substitutable candidate cities that are looking for mobile capital? NUP holds that these investment choices are made as an effect of change at national or international scale (Cox 1995; Wolman and Spitzley 1996).

However, Cox (1995) argues that in a capitalist economy this competition for mobile capital is necessary because there are many economic interests that are place bound and it is more important to examine local level determinants because those interests depend more on the local environment than on the national environment. There are two types of competition: weak and strong. Weak competition takes place over availability of raw materials, labor, and technology at a cheaper price. Strong competition takes place over revolutionizing productions by pushing the economy toward new products, new forms of organization, new materials, better machineries, creative financing, etc. As there are growing multi-location corporations, and vertical integration of production, strong competition requires a spatially dependent plant setup. So, for the territorial dependency of the firms, cities also have some bargaining power. NUP, however, looks at the weak competition only and commonly assumes that cities or communities have a weak bargaining position (Cox 1995).

Politicians also have incentives to do symbolic and visible projects like the ones that generate employment, and the ones that are related to physical or land development in order to get positive evaluations from the voter base (Jensen and Malesky 2018; Wolman and Spitzley 1996). Apparently, political leaders have benefits in using the incentives to lure out-of-state firms. Especially, the incumbent candidate offers incentives to lure a firm to claim credit of creating employment to win reelection. Again, it is also about winning the firm's location from the neighboring competitor, which is also rewarded by the voters (Jensen and Malesky 2018). The proclivity to use incentives happens when there is an upcoming electoral pressure or when the candidate will be held responsible for failure to create jobs or economic growth. Finally, politicians and bureaucrats consider their success of bringing firms into their locality as their professional ability to convince a firm to locate in their own-state. So, states do strategic decision making in response to neighboring states' decisions (Walker 1969; Wang 2018). If neighboring states increase economic development incentives (EDI), the state also increases EDI. The competition with the neighboring states is from the motivation of pulling skilled labor, checking immigration, and also giving voters a sense that their home state is better than the neighboring states (Jensen and Malesky 2018).

There is also a growth machine theory that views the growth of cities as a phenomenon driven by private interests (Logan and Molotch 1987). According to this view, the concentration of economic activities helps a group of people who owns local property. Therefore, this group utilizes political leadership to use public money in infrastructural development as a growth machine, which in turn brings inward industrial investments and immigrant people. For the increase in economic activity, land value increases, and so does rent. Along this line, there is another theory – quid pro quo – stating that private parties contribute campaign money and

politicians in return provide them economic development incentives. However, Jensen and Malesky (2018) did not find evidence to back these theories.

2.5 Innovation and diffusion of economic development policies

Innovation is an idea, object, or practice that is perceived as new by the adopter individual or another unit of adoption (Rogers 2003). Diffusion is process by which an innovation is communicated in a social system by some channels (Rogers 2003). There are four main elements of diffusion: the innovation, communication channels, time, and the social system. Usually, technology is used synonymously with innovation. A technology has a hardware and a software part. A hardware part is the tools involved with the technology and the software part is the information base behind the technology. As the adopters seek to reduce uncertainty they ask two questions about the new technology: what the technology is about and what are the consequences (Rogers 2003). The interrelated technologies (also called technology clusters) are interdependent, and innovation in one technology may bring an innovation to another related technology (Porter 1998). Communication channels are the means by which an innovation is communicated. There are homophilous and heterophilous individuals and societies. Diffusion occurs more among homophilous units than among heterophilous units. More effective communication happens among homophilopus units that belong to the same social group, are located near to each other, and share the same interests (Rogers 2003).

The third element, time, is involved in the diffusion process in three ways: first, is the initial decision whether to adopt or reject an innovation; second, innovativeness – is the relative earliness or lateness to adopt an innovation; third, rate of adoption, i.e., the number of members that adopted an innovation in a given time period (Rogers 2003). The initial decision may follow

on five main steps: knowledge, persuasion, decision, implementation, and confirmation. Knowledge is awareness of the innovation, persuasion is making a favorable evaluation of the innovation, decision is adopting the innovation, implementation is practically applying the innovation, and confirmation is when the adopter seeks reinforcement of the innovation. Rogers (2003) introduces five categories for innovativeness: innovators, early adopters, early majority, late majority, and laggards. Adoption of innovation is subject to the cost of uncertainty. The innovators are able to cope with more uncertainties. The late majorities are low in social status, do not use media channels much, etc. Finally, the rate of adoption is measured by the time required for a certain percentage of members to adopt the innovation. However, adoption depends a great deal on the social system. One innovation diffuses quickly in one system but can be slow in another system (Rogers 2003).

The fourth element of diffusion, social system, is a patterned structure that modifies the diffusion process. A change agent acts based on the norms of the social system using opinion leaders to diffuse a new idea. Change agents try to introduce innovations that have desirable, direct, and anticipated consequences. However, innovation in organizations depends on a set of other conditions such as champions and opponents of an innovation and openness and the formalization of the organization. Rogers (2003) find that the factors that positively influence organizational innovation include leader quality, expertise of the workforce, resource availability to everybody, size of the organization, and openness of the organizational systems. The factors that negatively influence include centralization of the organizational system and formalization in the working hierarchy among others.

Whether an innovation will diffuse depends on five basic characteristics of innovation: relative advantage, compatibility, simplicity, trialability, and observability (Rogers 2003). These

factors should work in the diffusion process of government policies as well. Policy diffusion happens from one government to another government and from one department to another department within a government. In other words, diffusion happens horizontally from state to state and also vertically from the national level to state, from state to city, from city council to service departments, etc. (top-down) and the other way around from city to state, sate to national, etc. (bottom-up) (Boehmke and Pacheco 2016; Gray 1973). The policy decisions of a government can be influenced by earlier policy decisions in other governments (Gilardi 2016; Gray 1973). There are three agreed upon mechanisms in which policy diffuses: learning, emulation, and competition. Learning refers to the policy making of one unit receives input from the consequences of policy outcomes from another unit. Emulation is more like a reaction to other unit's policy choices. It can have symbolic similarity but differing objectives. Competition is straight forward, in that competition occurs among units attempting to attract or retain resources. There is yet another type of diffusion mechanism namely a coercive mechanism which may happen from national/international pressure to adopt a policy (Gilardi and Wasserfallen 2019). However, there is a lack of conceptual consistency in the diffusion literature such as diffusion researchers use geographic proximity as an indicator of both learning and emulation. However, geographic proximity can show an outcome of diffusion but not necessarily can show the process of diffusion. Again the over use of the neighboring variable as an indicator of diffusion also creates confusion because neighboring clusters do not necessarily mean diffusion, nor do neighboring ties mean there is a diffusion network (Gilardi 2016). Nonetheless, in terms of theoretical advancement, scholars find that states that are similar in capacity tend to follow each other and that learning from failure happens especially if states have similar ideological status or legislature type (e.g. professional legislature) (Boehmke and Pacheco 2016). Adoption

speed is one area which is not looked into much (Mallinson 2016). Innovative methodological improvement is required alongside theoretical development to move this field forward (Boehmke and Pacheco 2016; Gilardi 2016).

In political science, diffusion research has become widespread after the pioneering work of Walker (1969) and Gray (1973). They contend that expenditures, as a measure of policy, can be misleading because some states can achieve more effect with spending less money. Many scholars measure political influence from the conflictual policy issues by observing who wins the conflicts in the legislative process (such as based on roll call votes). However, winning conflictual issues may not indicate political influence because the non-conflictual agendas that are enacted unanimously make up most of the votes and the initiators of those vast majority of policies may have more political influence (Walker 1969). So, a more important question is who initiates a program. As such, central to diffusion research is identifying the innovation of policies by the pioneer states and the patterns that the other states show in following the pioneering states. States work as a democratic laboratory: if one state finds a policy successful, other states follow that policy, and if one finds a policy unsuccessful, other states avoid that policy (Karch 2007). Walker (1969) finds that California, New York, and Michigan are states that have the top innovation score while Mississippi and Vermont have the lowest. Defining the first 10 adopters as innovative states, Gray (1973) finds similar to Walker (1969) that rich states (based on personal income) and competitive states (based on electoral margin of governor elections) are innovative. However, depending on the issue and time, poor states can also be innovative (Gray 1973). In terms of who follows whom, Gray (1973) finds that federal adoption of a policy has significant influence on that of the states. There are also some regional clustering: the South follows southern states, the Rocky mountain region follows their neighbors (Walker 1969).

Policy diffusion happens through four stages of policy making: agenda setting, information gathering, customization, and enactment (Karch 2007). Karch (2007) argues that time constraints and electoral considerations are the key factors in determining which policy to advance and which to ignore. Time constraints and electoral considerations play out differently at the four different stages of the policy making process. At the agenda setting stage, time pressed officials tend to choose innovations that are salient and do offer visible impacts (Karch 2007). Not the effectiveness of a policy's content, at this stage, but politicians' perception of the merit of the policy and the debate terms in the legislature determine which policies to bring forward (Gilardi and Wasserfallen 2019). National level debate can also influence the move of policies to the agenda stage (Karch 2007). At the information gathering stage, time constraints remain important, and officials intend to gather relevant information in a short time. So, they prefer agendas that have readily available information. At the customization stage, the elected officials tailor the policies according to the expectations of voter blocs and the organizations that have support of the voter blocs (Karch 2007). At the enactment stage, they will enact policies that are successfully adopted by ideologically congruent co-partisans. At the adoption stage, a host government adopts policies that are successfully adopted by ideologically congruent co-partisans. They also adopt policies that have electoral consequences in their reelection (Gilardi and Wasserfallen 2019; Karch 2007). Finally, a principal-agent relation is also at work whereas party leaders, governors, and chamber leaders act as agents of the party members to attain their electoral goals (Karch 2007).

According to the punctuated equilibrium theory, policy diffusion happens both incrementally and non-incrementally. Policy can diffuse suddenly at a faster rate or at a slow rate and can stop (Boushey 2010; Mallinson 2016). Boushey (2010) finds policy diffusion similar to

an epidemiological model of disease spread. Similar to disease contagion that depends on the susceptibility of the receptors, the infectivity of the agent, and the medium with which the agent is transported, policy diffusion in a national current context happens depending on the receptivity of the state, characteristics of the policy innovation, and the vectors such as interest groups that transmit the policy. In terms of speed, high salience policies have higher diffusion speed, and complex policies have less (Boushey 2010; Mallinson 2016). Complex policies are defined conventionally as the ones on economy, energy, trade, the environment, technology, health, and the like. Morality policy has higher chance of being spread immediately like an outbreak, while regulatory policies such as economic policies require more technical expertise, so such policies depend on the capacity of the state. Governance policies tend to be slow and incremental. Policies that have federal intervention such as federal incentives have a higher speed of adoption. Considering state legislative capacity, states that have citizen legislatures are less likely to adopt new policies immediately than those with professional legislatures as the latter have more capacity to innovate (Boushey 2010). From a policy cluster point of view, policies that are clustered—adoption of one innovative policy influences adoption of other related policies, such as a technology cluster—have higher adoption speed than average (Mallinson 2016).

Scholars growingly studying more of the innovation process in organizations than innovativeness of the organizations. Organizations have a predictable structure, which is viewed through their predetermined goals, prescribed roles, authority structure, rules and regulations, and informal patterns. Organizations adopt innovations through stages – initiation and implementation, in the initiation stage there are two sub stages: agenda setting and matching, and at the implementation stage there are three sub stages: redefining/restructuring, clarifying, and routinizing. At the agenda setting stage, the performance gap, which is the difference between

expected performance and actual performance, triggers innovation. Organizations continuously scan for innovations. Matching means identification of whether the innovation is a good fit or not. After this, the decision is made whether to adopt it or not. After the decision is made, the implementation process starts. Implementation begins by restructuring the innovation according to the organization's own structure. If the components are too foreign to the organization, there is a low chance of sustainability. The organization and the innovation both changes to some degree in the adoption process. The clarification stage puts the innovation into widespread use in the organization. If the users find it easy to modify according to their needs, the chance of sustainability is higher. The routinizing stage therefore depends on participation. The higher the participation, the higher the chance of sustainability of the innovation. In sum, there are some basic characteristics of organizational innovations. First, larger organizations are more innovative. Second, some organizational structure variables may play a positive role during the initiation stage but a negative role in the implementation stage. For example, low centralization, high complexity, and low formalization facilitate innovation at the initiation stage; but they impede innovation at the implementation stage. Third, the presence of innovation champions are required. Fourth, a performance gap in various organizational subunits triggers innovation. Fifth, in order to adjust with the attributes of the innovation or to make the innovation fit with the organizational systems, innovation and the organization usually change throughout the innovation process at any stage of the sub processes.

2.6 How effective are economic development policies?

Whether economic development policies bring benefit to people depends on the type of policy. The distribution of the benefits of growth from strong competition for territorial

dependency can shift to any social group depending on how the people that are in the local power strata decide (Cox 1995). According to Cox (1995), although NUP theories assumes that the growth benefits the underprivileged group only, it does not. It depends on how the growth coalition wants it to be distributed. One possibility is that the benefits will reach rich suburban residents if policies are such that appreciation rates of home values increases, property tax decreases, and public service expenditures increases (Cox 1995). However, the poor will benefit if policies are such that education costs decrease, public service expenditures decrease, and home values decrease.

In terms of weak competition, if the firms/industry compete for availability of raw materials, labor, and technology at a cheaper price, there will be locational substitutability. So when industries are incentivized, that doesn't contribute to economic development, rather it increases inequality because it uses taxpayers' money to help the private sector (Woodward 2012). This is such because of a redistributive mechanism at work – by forgoing tax, a state government has less ability to finance welfare projects that would benefit the poor (Jansa 2020). Again, the incentives given are ultimately benefitting either the firm owners or the existing employees. But the local unemployed people are not getting the benefit that they would have received through welfare projects (Jansa 2020).

Economic development incentives can cause income inequality for a market conditioning mechanism: this mechanism works if incentives are given in a regular market condition, i.e., if market conditions don't change for incentives (Jansa 2020). For instance, if the minimum wage law is not updated, pro-labor policies are not adopted, incentives to recruit firms would cause inequality. So, without changing market conditions, if incentives are given after taxes are paid, inequality will result in the long run (Jansa 2020). However, there are heterogeneous impacts for

different policy incentives (Thom 2018). Thom's (2018) study on incentives for the motion picture industry finds that for transferable credits, there is a little impact on employment and for refundable credits, there are some positive impacts on wages. In his study, there are 26 states that utilize the refundable credits implying that the states have targeted beneficiaries in the film making firms who receive the benefits of wage growth. This beneficiary group is fixed and already in the industry. So, in this case too, incentives increase inequality. Thom (2018) concludes that the basic idea of providing benefits to a few and diffusing the cost to many is at work. Also, there is no economically advantageous situation for any state but New York and California to invest in the motion picture industry, but still they spend money most probably because their peers do so and they also fall in a tendency to take an action without doing any cost-benefit assessment.

The literature of economics examines many variables of economic growth and identify mixed results. Reed (2009) examines the robustness of 32 variables and finds 12 variables to play a role in economic growth. He categorizes them into 4 groups: labor, economy, political, and public sector characteristics. From labor and economic aspects, he finds education, share of working age and female population, size of agriculture and mining sectors to be responsible for economic growth. From public sector and political aspects, he finds size of federal sectors, federal aid, decentralization, and some types of taxes to play significant roles in economic growth. Jones (1990) examines the impact of several policies (education, highways, welfare, hospital/health, and police/fire) on business establishments, employment, personal income, and per capita income and finds that the size of the public sector is not associated with decline. He finds that overall expenditures have little impact on economic growth, which may not affect the existing variation among states. On various policy types, some promote growth and others limit

growth. Welfare expenditures such as hospital/health are associated with economic decline. Local expenditures such as on police/fire and education promote growth. Highways negatively affect business establishments per capita income but do positively affect employment and personal income.

The tax literature finds fiscal policies to be ineffective but spending on human capital and infrastructure to have positive effects on economic growth but with spillover effects. Atems (2015) finds that a 1% fiscal deficit decreases growth by 0.43% in the short run and 0.39% in the long run. Private investment and employment have both short run and long run positive impacts on growth, but spending has no impact. A 1% increase in tax decreases growth by 0.37% to the own-state and 0.94% to the adjacent state as a spillover effect, which is 1.15% for both states combined. Similarly, Ojede, Atems, and Yamarik (2018) find positive and spillover effects of spending on education and infrastructure on economic growth.

Contrary to these studies, Bartik (1991) argues that local economic development incentives help the local economy as well as the national economy. He argues that if services to business increases, jobs will grow. With the growth of jobs, locally unemployed people will be hired before the in-migration takes place for the jobs. Although the incentivized development results in higher land prices in the short run, it improves human capital of the workers that get the jobs immediately. Since both firms and households are mobile in the long run, these workers, with the improved human capital would get better jobs in the long run. And, there are also political pressures to use incentives in high unemployment areas, so such incentives basically help the poor (Bartik 1991).

However, there should be differences for entrepreneurial and locational incentives where the former should reduce and the latter should increase inequality (Jansa 2020). Along the

entrepreneurial policy line, Leicht and Jenkins (2017) find that state high-tech development policies increase job growth. One strategy is called technopole strategy that advocates infrastructure development in particular areas that would support high-tech industries. Another strategy is called entrepreneurship strategy, which is supportive of a more decentralized approach that advocates supporting the entrepreneurs through various assistance programs. Leicht and Jenkins (2017) Test these theories using seven development policies and find that government policies that support entrepreneurs have a positive impact on job growth, especially when they are in concert with locational agglomeration. Regional science scholars also advocate that entrepreneurial assistance helps local economic growth (Porter 2003; Woodward 2012).

Similar to the effect of entrepreneurial policy, the regional science literature advocates competitiveness and innovation in companies and nations through clusters of industries that contributes to sustained economic growth. A cluster is an economic unit that can happen across the boundary of counties, cities, or states (Porter 2007). A locally grown cluster of firms benefit local growth because they specialize in a certain industry, they share intermediate inputs, and they can hire from a stronger labor pool (O'Sullivan 2011). A competitive nation is one, which is forward looking, encourages innovation, and maintains policies that do not bias competition by favoring select companies (Porter 1990). Porter contends that factor conditions for innovation and productivity are created in a competitive nation. Over dependence on natural endowments is not sustainable if the factor conditions are not upgraded to a newer level. Again, monetary policies such as exchange rate and fiscal policies to undermine competition are also detrimental to growth and competitiveness.

The determinants of competitiveness are factor conditions, demand conditions, related and supported industries, and firms' management and competition with other firms. Factor

conditions include skilled labor, infrastructure, etc. to compete with global firms. Demand conditions is demand in the home market that force companies to upgrade and make them ready for the foreign markets. Related firms are necessary in order to support the traded firms with taking advantages of necessary forward, backward, and horizontal linkages. Finally, firm management strategy needs to welcome competition, rivalry, and change because the pressure of change helps to create innovative outputs, which is better than the rival companies. These four determinants work together as a system and define a country's competitive advantage (Porter 1990). Domestic rivalry leading to improvement and geographic concentration facilitating flow of information interactively makes these determinants to transform into a system, a system that brings a competitive advantage for the industry. So the related industries tend to cluster physically and engage in competition. This competition benefits them mutually because competition leads them to go through self-reinforcement processes (Porter 1990). They also get connected by a vertical buyer-seller linkage or by a horizontal common customers, technology, and networks linkage. Thus, clusters help upgrading the industries with faster diffusion of new ideas and technology and overcoming inward focus, inertia, accommodation among rivals, and the like (Porter 1990).

Porter (1990) challenges the doctrines that the government should help companies with incentives and that the government should adopt a laissez-faire approach. He rather argues that government should adopt a middle ground by enabling a fair competition for firms. With incentivizing firms, government insulates them from the pressure to compete with foreign companies. So, they become slow to innovate and eventually fail. Similarly, leaving everything on the market is harmful because companies tend to merge, create alliances, to monopolize the market, which also eventually hinders innovation in industries in the home country, resulting in a

failure while competing with foreign companies. Porter (2007) asserts that federal policies are absent for clusters. He criticizes the duplications of economic development expenditures done for training of labor, export promotion, infrastructure investment, etc. but suggests using them instead for clusters. Federal policy should avoid funding individual firms or targeted industries; rather, they should be directed to the clusters. Since each cluster is unique and they promote competitiveness and innovation, governments should focus on clusters. The focus should start by identifying the clusters based on some criteria to find out related industries in a region. In sum, the following policies should be taken for the clusters: avoiding funding individual targeted business entities, taking an integrated approach of economic policy for the clusters (e.g., training for the entire workforce in a cluster), creating federal economic programs focusing on the clusters, and designating the clusters.

2.7 Empirical analysis

In order to operationalize what economic growth would mean, it is important to understand the difference between the terms with similar meanings. The literature on subnational economic growth largely ignores the difference between economic growth and economic development, rather uses the terms interchangeably (Wolman and Spitzley 1996). While the term, economic development, encompasses broad economic wellbeing such as capacity of the economy to deal with changes, participation of population in economic activities, distribution of resources, etc., the term economic growth measures economic wellbeing in terms of measurable indicators such as income and employment (Kindleberger and Herrick 1977). Although many studies of subnational economic growth discuss economic development to mean broad economic performance, all studies use one or more of the indicators of economic growth either directly or

as a proxy of economic development or economic performance (Wolman and Spitzley 1996). Some studies also mean physical development such as highways, ports, air terminals, and building of other infrastructure by economic development. Finally, some other studies use both growth and development together to mean economic performance (e.g. Glasson and Marshall 2007). The most common variables that scholars use to indicate economic growth, development, or performance are growth of employment, income, and GDP.

Measuring economic growth using various subnational/local geographic entities as the unit of analysis makes it difficult to make comparisons across studies. Most scholars analyze economic growth from the city level or metropolitan level and label that as local level economy. Some county level studies also label the economy of the county as local level economy. Nevertheless, many studies take states as the unit of analysis. Taking states or local level entities as the unit of analysis has one problem, which is how to address the spillover effects of businesses or industries that share jurisdiction of multiple states or entities (Hui and Cho 2017). Consequently, the 'location quotient' used to measure industrial concentration in a geographical location poses some issues for spatial overlaps (Woodward 2012). Nonetheless, most commonly, the literature uses the administrative jurisdiction as the analytical unit, and notably, some studies use spatial econometric models and others incorporate calculations for geographical fixed effects in their models to address the fact that economic policies taken in one state can affect the economic growth of another state (Hui and Cho 2017). Given the above discussion, to examine the role of economic development policy on economic growth, I use GDP and personal income as the measures of economic growth.

Economic development policies are programs and various services that governments offer to help businesses. The federal government and the state governments offer technical

services and incentives to help businesses that have a national level significance. The federal programs mostly target businesses that are involved in international trades. The state governments are, however, the primary source of assistance that businesses receive in the states. Coordinated by the state governor's office, the economic development programs are executed by various government agencies and various government authorized agencies like private banks. Government agency that deals with economic development, sometimes together with community affairs, offer the most programs in the states (Table 1.2). The Council for Community and Economic Research (C2ER) has gathered program data for the states. C2ER has two different databases: one on program description and another on program spending. The descriptive database includes currently operational programs, and the spending dataset includes function-wise program spending since 2008. The descriptive dataset has details of program nature, program type, program purpose, start year, eligibility criteria, etc. for most of the programs. However, this dataset has some missing program start years that I need to measure innovativeness. I scraped the data in early 2021, and I find 2,076 active programs in 50 states and 1,396 programs (67%) have a program-start information. I also have some missing data for industrial target of a program, which I need to measure policy congruence. I have around 45% of the programs with information on program's target industry. The spending dataset, on the other hand, has a different categorization scheme from the descriptive dataset. These two datasets have different units of analysis and different program categories which make it difficult to merge these two datasets.

To test the theories on economic development policy, I look at the type of policy, innovativeness of the policy, and diffusion characteristics of the policy. On the type of the policy, I distinguish between entrepreneurial and incentive-oriented to see the effects of each of

them on economic growth. I control for traditional factors of economic growth that includes labor force and human development, infrastructural investments, and capital on research and development. In order to control for the effects of federal government incentives, I include federal infrastructure and R&D spending in the states. I also control for political factors of policy choices, which is an interaction term of policy choice and government ideology, to incorporate any effect of government's policy decisions depending on which party is in power.

Table 2.2 : State agencies that execute economic development policies in the U.S.

Department and agency (main functions)	Number of programs (Percent)
Economic development	729 (34%)
Community affairs	170 (8%)
Revenue and taxation	500 (23%)
Commerce, business and technology	302 (14%)
Agriculture	66 (3%)
Finance, bank and capital	166 (8%)
Energy services	37 (2%)
Film and tourism	38 (2%)
Natural resources and environment	89 (4%)
Labor and workforce	69 (3%)

CHAPTER 3

POLICY INNOVATION AND ECONOMIC GROWTH

As discussed in the previous chapters, policy innovation may lead to economic growth because of two primary reasons. One reason is related to market demand for the policy under consideration and another is related to the technology that may receive momentum for adopting a specific policy. First, innovation happens because there is a market demand for an economic product. Secondly, the economic product solves a current problem. An innovative policy diffuses if it has a market demand and if it is technologically effective. Demand for an economic product is always replaceable as new products emerge. Therefore, policy has to change in order to address the new dimensions of the new product. Therefore, innovation in policy is a dynamic phenomenon. The entities that are already advanced in terms of their experience with the previous versions of the economic product are more likely to innovate the policies that may create some advantages to the newer versions of the product. The new products can make economic revenue if they can respond to the market demand. The entities that can offer new products constantly may have advantages in increasing their economic growth. On the other hand, the technology that can offer both easy-to-handle hardware and easy-to-process software is more likely to diffuse. Therefore, if an innovative policy does not diffuse, we may find that that policy lacks market demand and/or is technologically ineffective. These arguments lead to the

hypothesis that if a policy is innovative and if that policy diffuses, it should positively influence economic growth. In this chapter, we will see empirically whether this hypothesis holds.

Given the widespread mobility of labor and capital, economic growth of the states is a function of the state's competitive advantages (Porter 1990), the state's export based enterprises (Glasson and Marshall 2007), the state's entrepreneurship (Audretsch, Keilbach, and Lehmann 2006; Klobuchar 2013), and innovation (Klobuchar 2013). In order to capture whether American states have these advantages, this research looks at the per capita gross domestic product (GDP) and per capita personal income (Table 3.1). Using per capita measures are appropriate as to not give state's with larger economies more weight in the data. The per capita measures I use in this research is in current dollars. I did not use inflation adjusted measures because of three reasons: 1) I have monetary values (state's expenditure on economic development) in the independent variables which are not inflation adjusted, 2) I have considered a period of 2 years lag for the independent variables, attempting to adjust inflation would bias the dependent variable even more, and 3) the Bureau of Economic Analysis (BEA) has 2012 as the reference year for calculating real GDP but the data are between 2008 and 2019, so the impact of inflation would not be much in this analysis.

Figure 3.1 presents per capita GDP of various states in eight BEA defined economic regions. Per capita GDP of various states range from $31,000 to over $90,000 over a period of 12 years (Figure 3.1). The figure shows that the southern states have relatively lower per capita GDP than the northern states. However, there are high variations of GDP within regions implying that there is possibly no effect of neighboring states on GDP. Most of the states have an interquartile range of between $5,000 and $10,000 for a period of 12 years except a few states notably big states like New York, California, and Texas. This implies that, states with larger

economies have higher variation in per capita GDP than the states with smaller economies in the short run. This scenario suggests that, even if there might be minute regional effects on economic growth, the modeling for GDP in the states should take account of state's individual effects in order to address unique characteristics within each state.

Table 3.1: Required data for Hypothesis 1: Policy innovativeness leads to economic growth (*H1*)

Dependent Variable	Independent Variable	Control Variables	Unit of Analysis
1. Per capita GDP (BEA) 2.Per capita Personal Income (BEA)	1. Innovativeness as a factor program count* (C2ER) 2. Innovativeness as a factor of program spending* (C2ER)	1. Federal funding on transportation (NASBO) 2. State government's funding on higher education (NASBO) 3. Waged and salaried employment (BEA) 4. R&D Expenditure in the states from federal, state, and private sources (NSF) 5. State government's ideology (Berry et al. 2010)	State-Year

Notes:
Acronyms in the parentheses are data sources—
BEA = Bureau of Economic Administration,
C2ER = The Council for Community and Economic Research,
NASBO = National Association of State Budget Officers, and
NSF = National Science Foundation

* Author computes the innovativeness based on C2ER program data

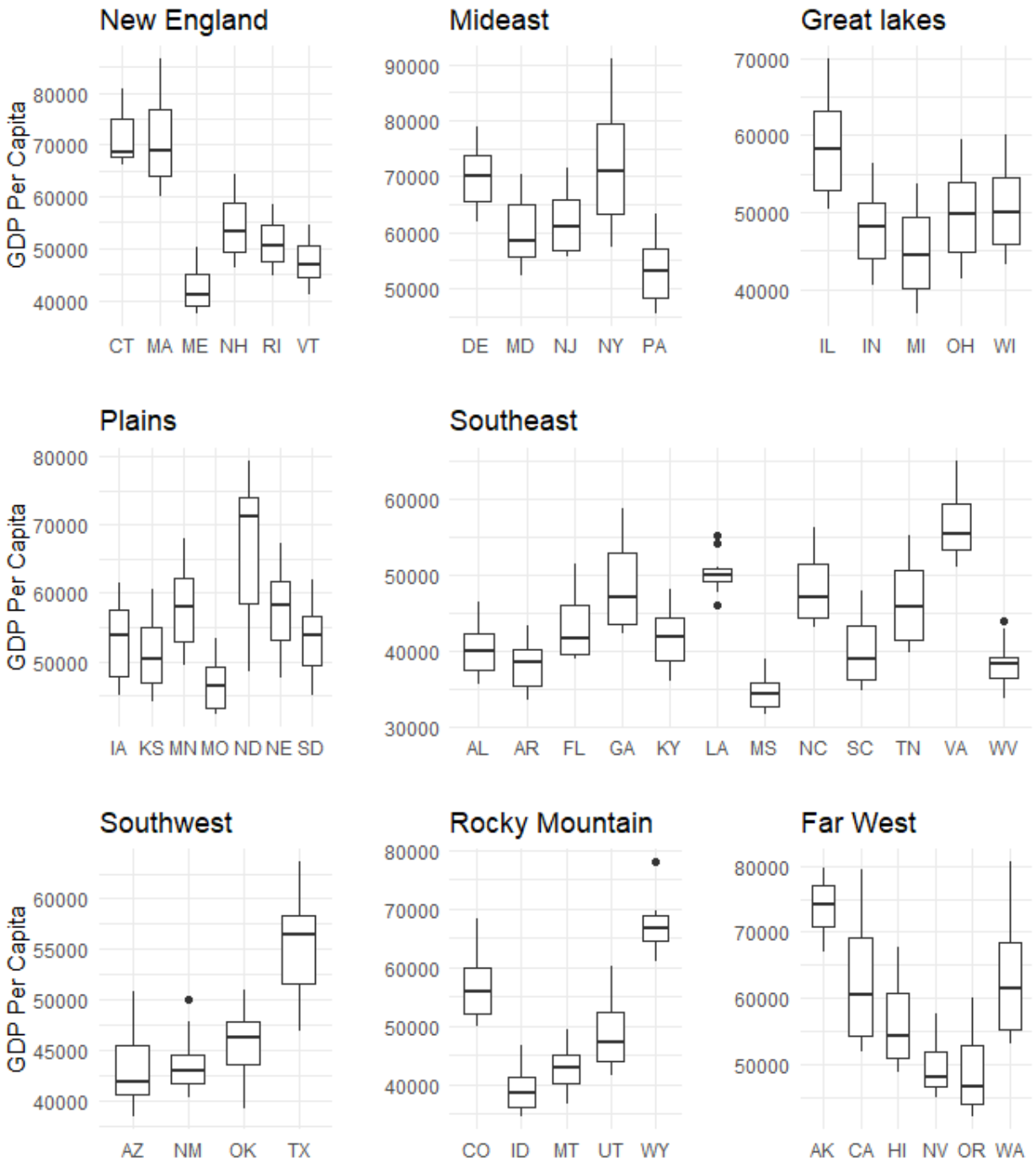

Figure 3.1: Per capita GDP of various states for 2008 to 2020

Policymakers and researchers both agree that not just demographic factors but more dominantly fiscal and economic policies influence economic growth. All fiscal and monetary policies and some dominant economic policies are taken at the federal level government agencies. For instance, the Federal Reserve focuses on price stability by rules based monetary policy but fails to pay attention to unemployment (Brady 2013). In order to grow employment, some suggest that monetary and fiscal policies needs to be predicatable so that investors can have a better sense of their investment and operational costs (Boskin 2013). In order to reduce the debt/GDP, spending on entitlements needs to be reduced and controlled. Some suggest to focus on education to train the labor with industry-demanding technologies (Klobuchar 2013). Economists growingly suggest fiscal consolidation, i.e., lowering federal spending to boost economic growth in the long run (Boskin 2013; Goolsbee 2013). In light of the role or importance of economic policies, this research principally looks at economic policies adopted by the states and how innovative those policies are. Secondly, it also looks at how those policies diffuse within the state in terms of scale of the policy implementation. It looks at how many programs are adopted and how much money is spent by a state.

I use a number of control variables that are widely accepted as to impacting economic growth: infrstructure, education, R&D expenditures, labor, and government ideology. As fiscal policies and monetary policies are made at the federal level, I take account of federal expenditure on infrastrucuture in the states that may boost economic growth. I use per capita federal spending on transportation as a factor of economic growth. I do not use state level infrastructure as a separate variable as state's infrastructure spending can be included in my main independent variable. In other words, the program count and program expeniture variables include some expenitures on infrastrucutre. I use state level per capita education expenditures as a control

variable as a proxy of skills of the labor force. Although not all workers contribute to the in-state economy, the expenditures on higher education includes expenditures on research and development, making it a more robust variable to explain economic growth. I also use state's labor force (waged employment per 1,000 population) as an indicator of economic growth as well as state government's ideology as a control variable because ideology may be an indicator of the type of economic policies to be adopted by the states. That's why I also use an interaction term of state ideology and policy innovativeness to see how that plays out in the relationship with economic growth.

3.1 Policy diffusion and innovativeness

As Rogers (2003) describes, an innovation is communicated in a social system through diffusion. The first to adopt a policy choice is an innovator. Thus, the American states that are the earliest in adopting a certain kind of policy are innovators for that policy. From there, I examine how the innovation has been diffused across the states and within a state. The states are the group that perceive a program as an innovation and individual government is the one that makes decision as whether to adopt an innovation or not. In order to compute innovativeness, I use both cross-state and within state diffusion processes. A state may have innovated a policy but later stopped implementing the policy. Again, there may be another state that started late but has continued using the policy in the state. To be effective as a policy to contribute to economic growth, both the earliness of adopting a program and the frequency of the policy within the state are important. In other words, both innovation and its diffusion are necessary factors for increased economic growth. Therefore, in my measure of innovativeness I use both innovation and its diffusion to get a more comprehensive measure.

I use economic development programs and their adoption years to compute a state's innovativeness for all programs and certain categories of programs. First, I will discuss uncategorized programs and later in the chapter, I will discuss the various categories of the programs. Figure 3.2 shows cross-state diffusion of all economic development polices and Figure 3.3 shows within state diffusion of the same policies. From Figure 3.2, we see that economic development programs were first adopted in 1933 in Utah. The states that immediately followed Utah were Louisiana, Arkansas, New Mexico, Nebraska, and Maine. With respect to the states' innovativeness, I classify them into three categories as innovators, early majority, and late majority. I name the states that adopted policies in the first 20 years of a policies initial adoption as innovators and the states that adopted within the next 20 years are early majority and states that adopted beyond 20 years as late majority. I group states by these categories in the figure but in actual measure of the innovativeness, I use the data that says how long the program is active in the state. Although some states are innovators, they do not necessarily continue with the program in the state. Some states are late adopters, but they have adopted a large number of policies and continued operation. For instance, although Louisiana was an early adopter, at times, Maryland, Kansas, and Oklahoma surpasses Louisiana in terms of number of policies adopted in the state (Figure 3.3). Figure 3.3 shows diffusion of programs within the state. I hypothesize that both innovativeness and diffusion thereof together contribute to economic growth (*H1*). Hypothesis 1 captures both of the factors as to when the policies were adopted and how many of those policies are active in the state.

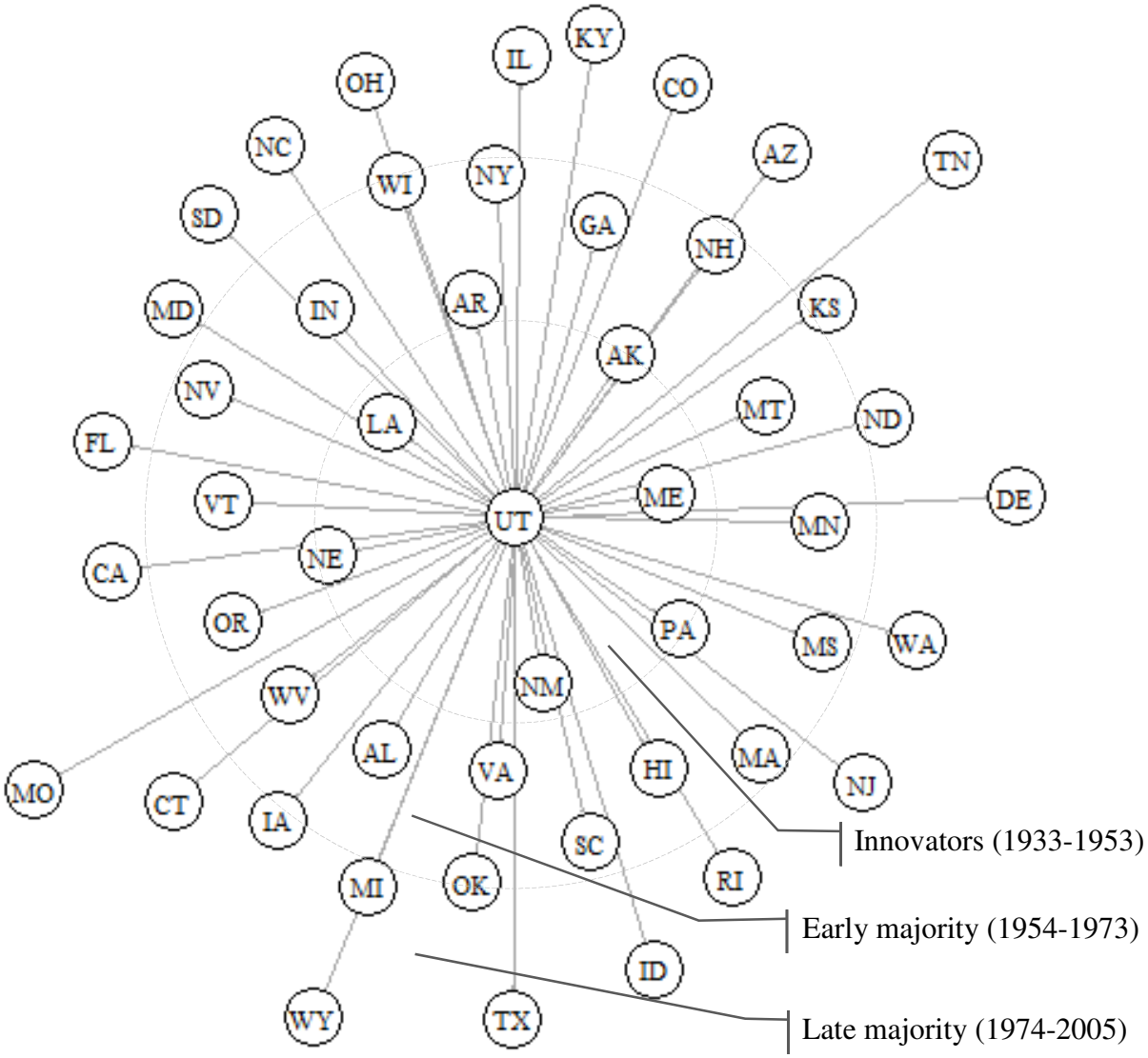

Figure 3.2: Diffusion of economic development policies in the American States: First started in Utah in 1933 and the latest in Tennessee in 2005

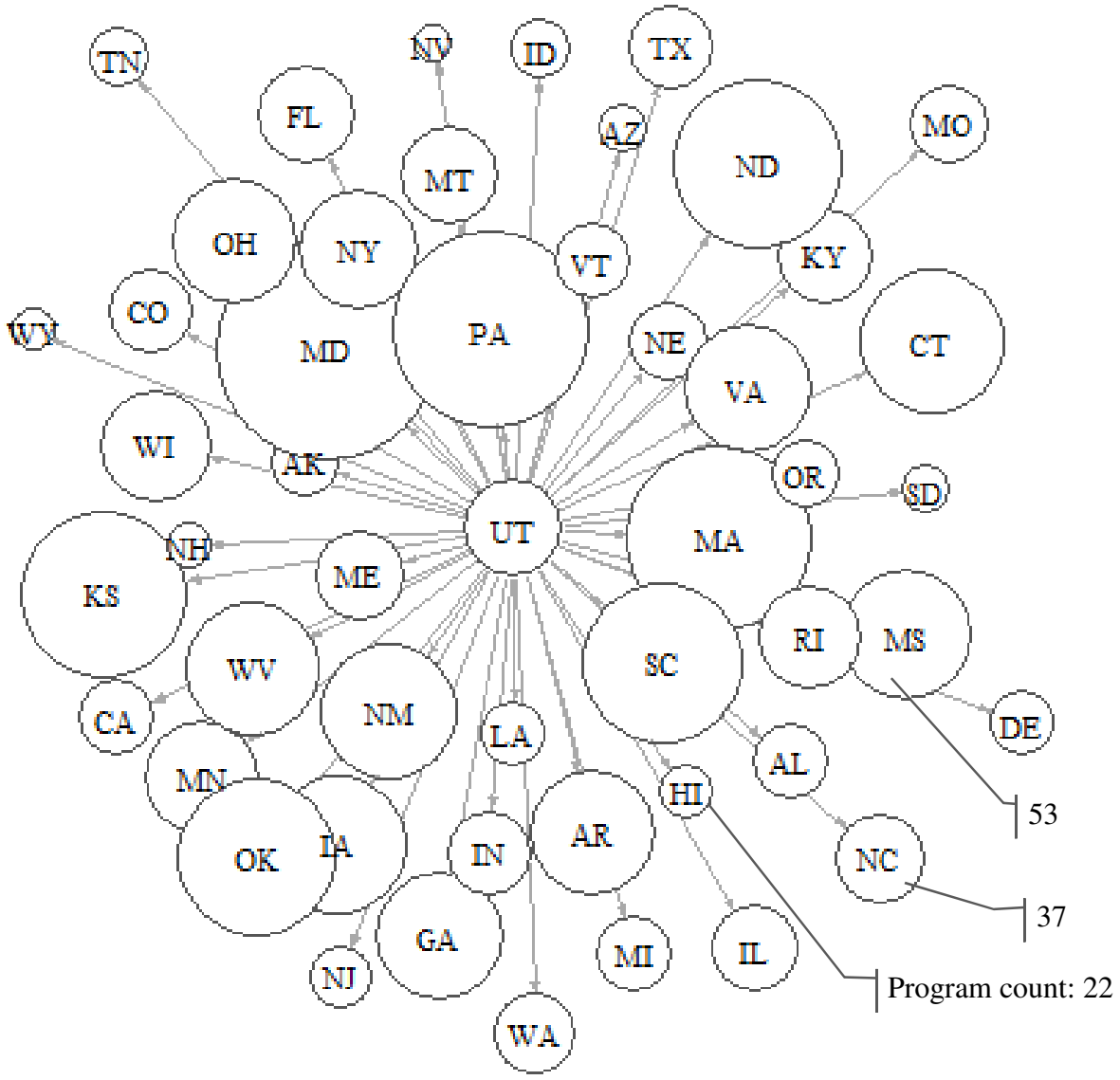

Figure 3.3: Diffusion of economic development policies within and across the American States: Maryland currently has the highest program count, 90, and Louisiana, although an innovator, currently has 27 current programs.

3.2 Methods and models

I hypothesize that innovation in policymaking leads to economic growth. More specifically, I hypothesize that regardless of policy-type, innovativeness promotes economic growth *(H1).* This model assumes that innovation of policies happens in a state when it has tried or experienced other alternatives and that innovation originates from in-state conditions to address exclusively in-state problems. So, the early adopters will follow the leading adopter because they share similar conditions such as ideological and/or similar implementation capacities. I am using state fixed effect models in order to address unique conditions in each state. I also use a lagged variable approach assuming there is a time-period for a policy to take effect on economic growth. I assume a 2-year lag for innovativeness of the programs because the programs may take some time to effect businesses. For the same reason I take a 2-year lag for federal funding on transportation, state funding on higher education, R&D funding in the state, and state government ideology. However, I did not consider any lag on employment as labor immediately affects the economic output of the business.

3.2.1 Computing innovativeness

I compute innovativeness using two factors: 1. How quick is the state to adopt a new program category, and 2. How many programs of that category the state adopts over a period. I also examine how much money states spend on economic development programs. To answer the first question, I use the following formula:

Innovativeness for a policy, i at time t,

$$\begin{aligned} Inno_t &= (Year_t - Year_{start}) - (Year_{adopt} - Y_{start}) \\ &= Year_t - Year_{adopt} \end{aligned} \qquad \dots\dots\dots (3.1)$$

This measure provides the experience a state has with a program in a given year. The more experience a state has, the more innovative it is. However, when we see the state's relative position in terms of its innovativeness, starting a program earlier makes it always appear before its fellow states that start the program later. Innovation on the micro-components of a program may be still active, but innovation at the broad category is not an everyday phenomenon. That is why, as I compute innovativeness for the broad program categories, starting a program earlier does not necessarily make it more innovative. There can be a couple of reasons why adopting a program earlier may not contribute more to economic growth. First, it may have adopted earlier but may have failed to create an environment for the program to succeed. Secondly, it is possible that ineffectiveness is a reason why that program has not been adopted again within that state. This low frequency of adoption will reflect on the number of programs within a category of programs a state adopts. In other words, a successful program is more likely to be scaled-up or adopted by other governmental units within the state such as branch departments and sub-agencies. So, a count of programs is a good indicator of whether the program has diffused within, and whether the program category could have an effect on the economy of the state. However, the number of programs alone may not have an effect because a program may lose efficacy after some years, but if a state increases the number of programs that may not substantially positively affect the economy. Therefore, a product of how quick a state is to adopt a policy and how many programs it does adopt is a better measure of innovativeness.

For example, if state A adopts a specific type of policy in 1990, which was innovated by state B in 1985; in 2010, state A has 20 years of experience with that program and state B has 25 years of experience. In 2010, B ranks higher than A. if I continue the computation this way, in 2015, state B still ranks higher than state A, and state A has no way passing over state B.

However, that does not seem very reasonable because state A may have implemented other similar programs of that kind that have made positive impacts on the economy. In this example, if by 2010, State A has 30 programs and state B has 25 programs, state B still ranks higher because it has 25 years of experience and 25 programs in operation. By multiplying, it has a score of 625 but state A has 600 even if it has more programs in 2010. If the program increase continues, and if in 2015, state A has 40 program and state B has 30, state A will have a score of $40\times25 = 1000$, superseding the score of state B, which is $30\times30 = 900$.

However, for the second measure of innovativeness, expenditures will be a non-cumulative number of expenditures unlike the count of programs as I do not have historical figures on state program expenditures. I have expenditure data since 2008. For this reason, I use per capita yearly expenditure data, which should reflect the number of operational programs. However, if only yearly increment of programs is used, that would not have been reflective of yearly expenditures, as the yearly expenditures is not only for the new increment of the programs but the programs that are under operation in a given year. I multiply the expenditures with a state's experience with a program to get an innovativeness score based on program spending.

3.2.2 Fixed effect model

I employ fixed effect models by state because every state has some unique characteristics of its own that needs to be addressed in the model. Fixed effects accounts for state level differences that I do not control for in the model and that generally do not vary overtime. Tables 3.4 and 3.6 show the results of diagnostics tests to see if fixed effect models are more suitable for

the data. I will discuss this in the latter section. First, let us consider the following equation for the fixed effect model (3.2)

$Yit=\beta_0+\beta_1X_{it}+\beta_2Z_i+u_{it}$ … … … (3.2)
where the Z_i are unobserved time-invariant heterogeneities across the entities $i=1,\ldots,n_i=1,\ldots,n$.

We aim to estimate β_1, the effect on Y_i of a change in X_i holding constant Z_i.

Letting $\alpha_i=\beta_0+\beta_2$, $Z_i\alpha_i=\beta_0+\beta_2Z_i$ we obtain the model,
$Y_{it}=\alpha_i+\beta_1X_{it}+u_{it}$ … … … (3.3)

Having individual specific intercepts α_i, $i=1,\ldots,n_i=1,\ldots,n$, where each of these can be understood as the fixed effect of entity i, this model is called the *fixed effects model* (Arellano 2003). The variation in the α_i, $i=1,\ldots,n_i=1,\ldots,n$ comes from the Z_i and can be rewritten as a regression model containing n−1 dummy regressors and a constant:

$Y_{it}=\beta_0+\beta_1X_{it}+\gamma2D_{2i}+\gamma3D_{3i}+\cdots+\gamma nD_{ni}+u_{it}$ … … … (3.4)
Model (3) has n different intercepts — one for every entity.

3.3 Results: innovativeness and economic growth

I regress per capita GDP and per capita personal income on innovativeness as a factor of program count and innovativeness as a factor of program spending. Summary statistics of the variables used are presented in Table 3.2. The scatter plot for economic growth and innovativeness shows a positive relationship (Figure 3.4). I execute four models: 1) per capita GDP on innovativeness based on program count (2-year lagged), 2) per capita GDP on innovativeness based on per capita program expenditure (2-year lagged), 3) per capita personal

income on innovativeness based on program count (2-year lagged), and 4) per capita personal income on innovativeness based on per capita program expenditure (2-year lagged). The results are presented in Table 3.3.

Table 3.2: Summary statistics of variables for modeling innovativeness and economic growth for years between 2008 and 2020

	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum
Per capita GDP ($)	31602	43783	50545	52348	59136	91057
Per capita personal income ($)	29855	39260	44372	45577	50770	77289
Years program is active for (T)	5	31	40	42.16	51	88
Cumulative count of active programs (C)	2	16	24	26.49	34	73
Per capita program spending ($) (E)	2.1	14.8	25.4	44.3	45.1	427.7
Innovativeness score as a factor of program count (T×C)	10.0	567.8	987.0	1206.6	1579.0	5330.0
Innovativeness score as a factor of program spending (T×E)	32.9	307.7	644.2	1086.1	1293.9	19736.9
Per capita federal funding on transportation	3.6	117.8	154.5	192.6	200.8	1640.5
Per capita state funding on higher education	66.1	369.8	713.3	774.8	1062.8	2380.7
Per capita R&D expenditure in the state	0.17	2.5	4.5	6.0	8.1	24.7
Waged and salaried employments per thousands of population	385.6	436.5	464.6	467.4	493.6	650.6
State government ideology	17.5	26.9	44.5	44.1	61.1	73.6

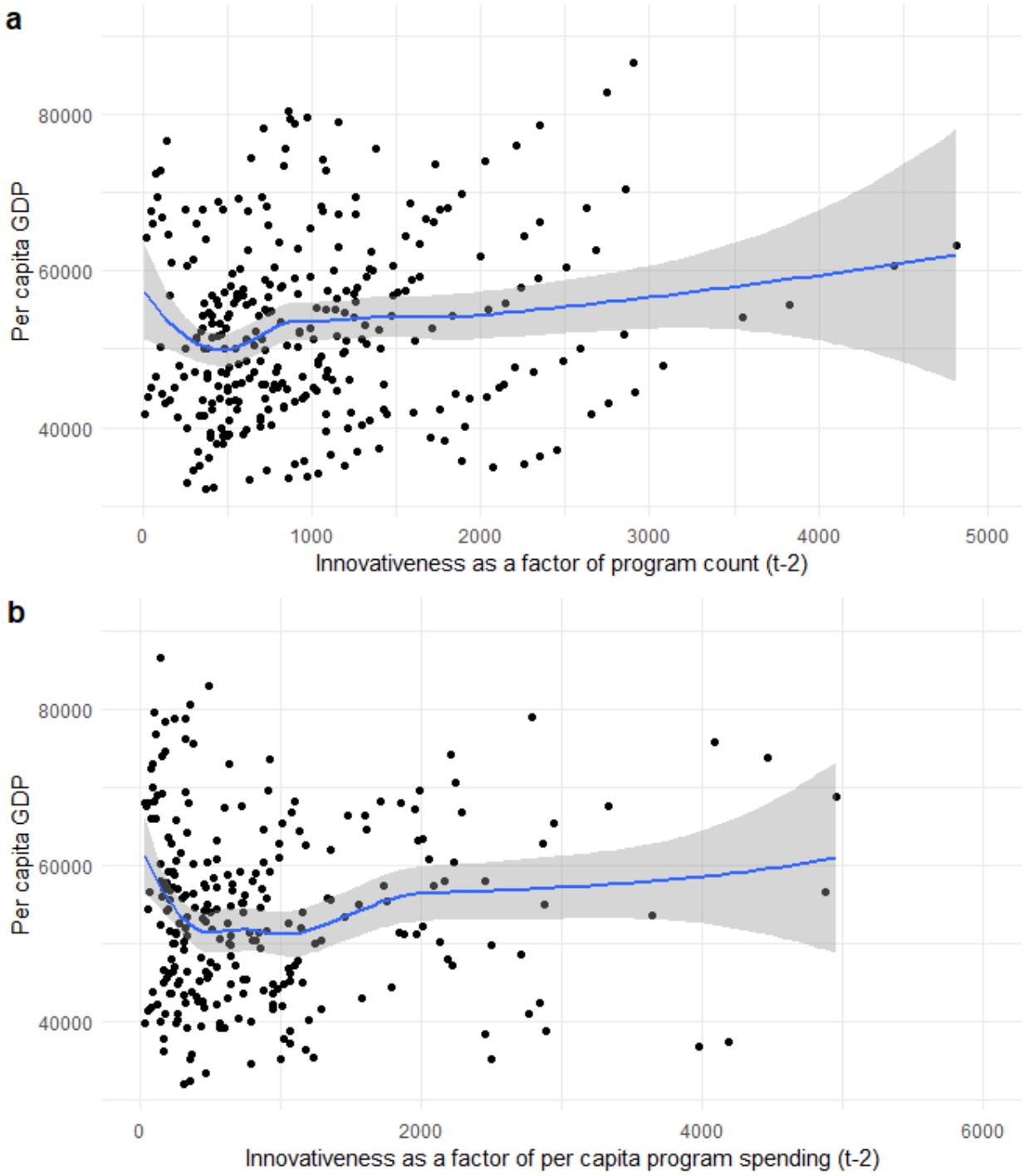

Figure 3.4: Scatter plot of per capita GDP and innovativeness

Table 3.3: Linear regression for GDP and personal income on innovativeness

	(Model 1) Per capita GDP	(Model 2) Per capita GDP	(Model 3) Per capita Personal Income	(Model 4) Per capita Personal Income
Innovativeness score as a factor of program count (-2)	6.48*** (1.30)		6.69*** (1.10)	
Innovativeness score as a factor of per capita program spending (-2)		1.21 (0.92)		3.34*** (0.79)
Per capita federal funding on transportation (-2)	6.79* (3.63)	4.74* (2.78)	12.93*** (3.05)	10.55*** (2.39)
Per capita state funding on higher education (-2)	4.71*** (1.20)	1.00 (1.05)	3.63*** (1.01)	0.42 (0.90)
Per capita R&D expenditure in the state (-2)	268.59*** (78.18)	-21.30 (69.83)	235.10*** (65.83)	108.85* (60.04)
Waged and salaried employments per thousands of population	196.65*** (16.22)	371.17*** (12.57)	151.60*** (13.66)	320.14*** (10.81)
State government ideology (-2)	-39.27 (31.33)	-1.99 (23.30)	-42.45 (26.39)	8.06 (20.03)
Innovativeness (count) (-2)* state ideology(-2)	0.049** (0.025)		0.049** (0.021)	
Innovativeness (spending) (-2)* state ideology(-2)		-0.018 (0.016)		-0.048*** (0.014)
Overall Intercept	-52395.0*** (7738.8)	-120780.0*** (6104.8)	-38418.0*** (6516.8)	-106260.0*** (5248.9)
Observations	283	235	283	235
Number of states	48	49	48	49
R-squared	0.75	0.84	0.79	0.86

Significance codes: p<0.001 '***' p<0.01 '**' p<0.05 '*'
Standard errors in parentheses

I find support for the hypothesis that economic growth increases as innovativeness increases (Table 3.3). Specifically, I find strong statistical significance for economic growth and innovativeness as a factor of program count. I also find strong statistical significance for personal income and per capita program expenditures. For Model 1 in Table 3.3, I find that a one-point increase in innovativeness may increase around $6 of per capita GDP. The control variables in this model have significant estimates except for ideology, and the model diagnostics (Table 3.4)

shows that I chose the correct models and included robust variables. Therefore, I can rely on the estimate for GDP and innovativeness in Model 1. However, Model 2 does not produce a statistically significant estimate. The diagnostics for Model 2 show that the model and variables are chosen correctly, as such the results do not support the hypothesis that innovativeness as a factor of program spending influences GDP. I again find robust estimates for personal income and innovativeness. I find that a one-unit increase in innovativeness based on program count and program spending may increase per capita personal income by $7 and $3, respectively. The diagnostics in Table 3.4 shows that Model 3 and Model 4 have correct model specifications. Model 3 and Model 4 also have all statistically significant estimates for the control variables. The results support the hypotheses that innovativeness influences per capita personal income.

Table 3.4: Model diagnostics for economic growth and innovativeness of programs (Table 3.3)

	(Model 1)	(Model 2)	(Model 3)	(Model 4)
F test for individual effects				
Within vs. Pooling model	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001
Time-fixed effects	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001
Hausman Test for Panel models				
Fixed vs. Random effect	Fixed p<0.001	Fixed p<0.001	Fixed p<0.001	Fixed p<0.001
Regression based Hausman test	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001
Regression-based Hausman test, vcov: vcovHC	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001

* As the data is an unbalanced panel, the models do not account for time effects.

3.4 Types of economic development policies in the American states

The results up to this point focused on the innovation and diffusion characteristics of economic development programs but have not categorized those programs. There are two primary categories that scholars use to analyze economic development programs: incentive-oriented programs and entrepreneurial programs (Table 3.5 and Table 3.6). Incentive-oriented policies are designed to provide direct or indirect business assistance to individual parties, namely, firms, companies, and similar business entities. On the other hand, entrepreneurial programs are designed to support the community to promote entrepreneurship from within the community. Tax reduction programs and business financing schemes are characteristic of incentive-oriented programs; whereas, community financing schemes are typically within the category of entrepreneurial programs. However, some programs have multiple parts falling under both of the above categories (Figure 3.5).

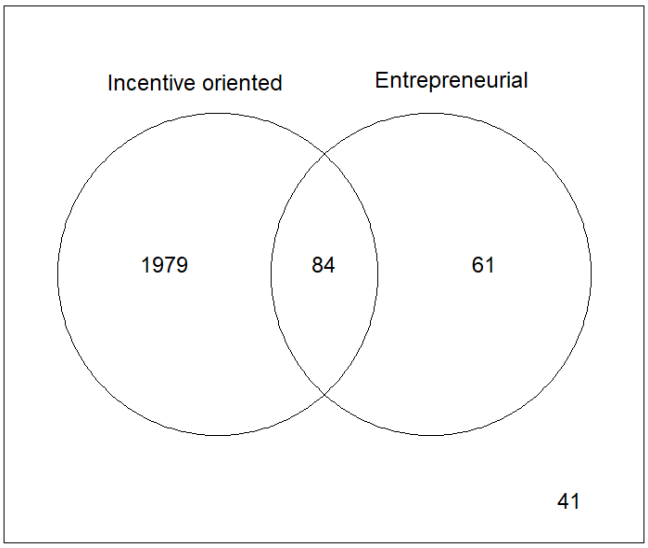

Figure 3.5: Venn diagram of overlapping programs between incentive oriented and entrepreneurial programs

From the C2ER dataset, I have a total of 2,165 economic development programs, among which 1,979 programs are wholly incentive-oriented and 61 are wholly entrepreneurial policies (Figure 3.5). There are 84 programs that are grouped as both incentive-oriented and entrepreneurial programs, and there are 41 programs that are not grouped as any of these categories. I have a total of 2,063 (1,979+84) incentive-oriented policies and 145 (61+84) entrepreneurial policies in the dataset (Table 3.5). These programs adopt various mechanisms to provide funding, which includes tax incentives, business finance, and community finance. Economic development programs mainly consist of various business finances and tax incentives. Each state has direct government agencies such as agriculture related agencies and indirect government authorized agencies such as creditor banks that administer these finances. These finances are provided as tax credits, tax exemptions, equity investments, grants, loans, and bonds under incentive-oriented programs. Under entrepreneurial programs, funding is provided as grants and loans to local government agencies.

Table 3.5: An overview of various economic development programs in the program-list dataset of C2ER

Economic Development programs (2165)	Incentive-oriented (2063)	Tax incentive (941)	Tax credit (585)
			Tax exemption (395)
		Business Finance (1148)	Grant (483)
			Loan (466)
			Equity investment (77)
			Bond (70)
	Entrepreneurial (145)	Community Finance (145)	Grant (98)
			Loan (34)

Note. Figures in the parentheses indicate number of programs currently operational.

The basic distinction, that seems reasonable from the C2ER program list dataset, between incentive-oriented and entrepreneurial programs is whether the program is designed for a private party or for a community. If it is targeted for a private party, it is an incentive-oriented program, and if it is designed for the community, it is an entrepreneurial program. I have another unrelated dataset from C2ER that is a record of spending on various economic development programs. The program list dataset and the program spending dataset have categorized the programs quite differently. Table 3.5 and Table 3.6 shows the difference of the categories. When using the spending data in modeling, I group the economic development functions into incentive-oriented and entrepreneurial programs based on the above definition. Functions like business finance and strategic finance clearly fall under incentive-oriented programs, and community finance under entrepreneurial programs. However, there are programs such as entrepreneurial development, which is given to private parties, but they are not essentially targeted to recruit out-of-state firms. Again, tourism/funding is grouped as one category but tourism funding is for the community, but the film industry funding goes to private parties. That is why I group entrepreneurial development and tourism/film under both incentive-oriented and entrepreneurial programs. However, this grouping does not sound very appropriate because the actual dollar amount falling under each side was necessary to attain a reliable modeling output. Moreover, there are other possibilities of duplications such as in workforce preparation and development. I group it under incentive-oriented programs but if the skill developed through this funding is transferred to a local firm at a later time, then the funding can be regarded as entrepreneurial funding. However, I did not have enough space in this study to parse that out. Alternatively, I use workforce preparation and development under both categories and use that categorization separately in

another model to see the output. This output is provided in the Appendix (Table A.2 and Table A.3)

Table 3.6: An overview of spending on various economic development functions in the spending dataset of C2ER

Economic Development programs ($223.7M)	Incentive-oriented ($136.0M)	Business finance ($0.22M)
		Strategic business attraction fund (0)
		Business assistance ($6.14M)
		International trade and investment (0)
		Domestic recruitment/out-of-state (0)
		Workforce preparation and development ($11.77M)
		Technology transfer ($0.55M)
		Entrepreneurial development (0)
		Tourism/film ($21.34M)
		Special industry assistance ($16.76M)
	Entrepreneurial ($63.1M)	Entrepreneurial development (0)
		Minority business development (0)
		Community assistance ($25.44M)
		Tourism/film ($21.34M)

Note. Figures in the parentheses indicate spending of the median state in 2020.

With the program categories, first I run the models to see how the innovativeness of the incentive-oriented and entrepreneurial programs contributes to economic growth. Secondly, I run models to see how the innovativeness of the types of the programs namely, tax incentives, business finance, and community finance contribute to economic growth.

For the first group, incentive-oriented and entrepreneurial programs, I hypothesize that regardless of policy-type, innovativeness should increase economic growth. At this stage, I test incentive-oriented and entrepreneurial policies for their influence on economic growth. I again test both innovativeness based on program count (Table 3.5) and based on program expenditure

(Table 3.6). To capture innovativeness (how long the program is active for) and within diffusion (how many programs have been adopted), I use the same method as for the uncategorized programs from above. Economic development programs that are incentive-oriented basically started and diffused among most of the states as shown in (Figure 3.2 & 3.3). So, the diffusion of incentive-oriented programs looks quite similar to what we see for all programs in Figure 3.2 and 3.3. Here I have a depiction for diffusion of entrepreneurial programs (Figure 3.6) which have been diffused among 25 states (as the data shows) starting from Alaska in 1939. However, Alaska has not adopted many programs although the state pioneered the entrepreneurial programs. Although North Carolina started entrepreneurial programs late (in 1999), currently, it has the most entrepreneurial programs (11) followed by Texas (9) and Mississippi (9). Oklahoma, Rhode Island, and Vermont are among the states that started entrepreneurial programs after 2010. Connecticut, Idaho, and Colorado are among the states that started between the 1980s and 2000s. However, this dataset lists programs that are currently active. If any program that was started but also finished at some point is not listed in the dataset.

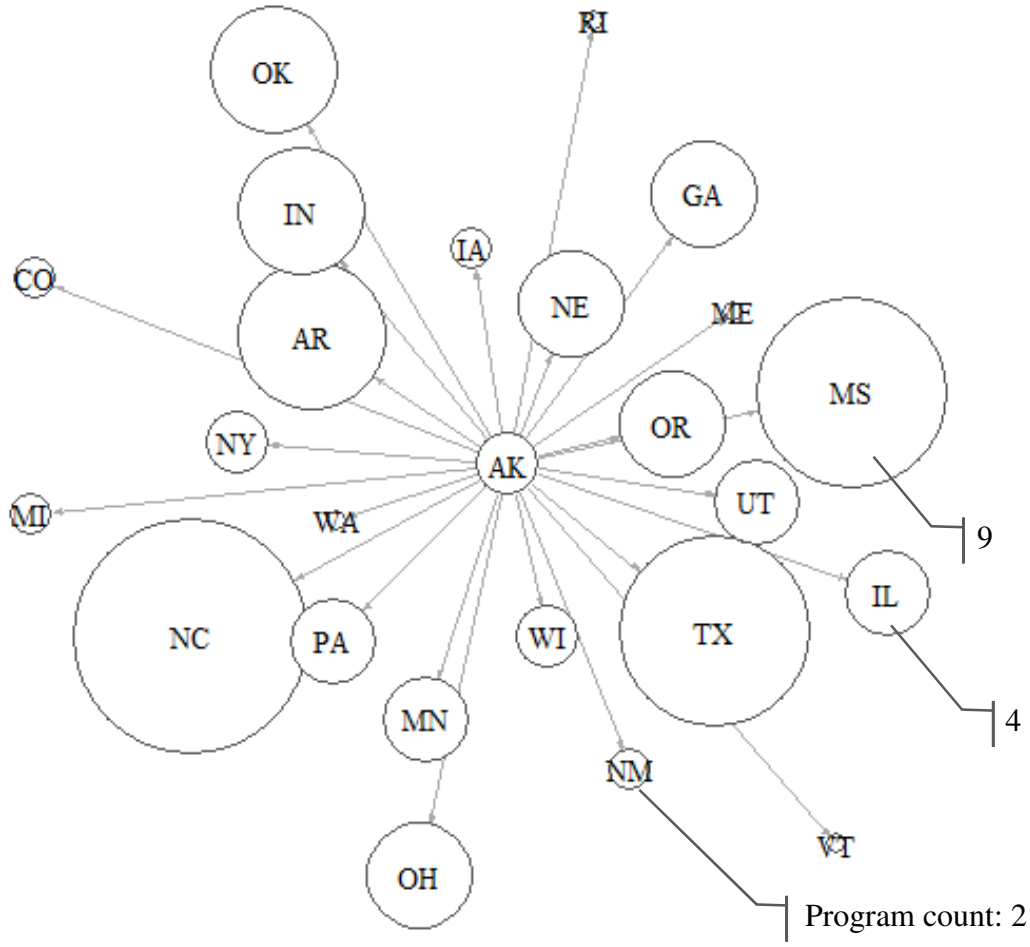

Figure 3.6: Diffusion of entrepreneurial programs in 2021 starting from 1939

I regress the same dependent variables (GDP and Personal Income) on the innovativeness scores for incentive-oriented programs and entrepreneurial programs. Summary statistics of the variables are shown in Table 3.7. I regress per capita GDP and per capita personal income on innovativeness based on program count and program expenditures for incentive-oriented and entrepreneurial programs. This produces four models each for GDP and personal income (Table 3.8).

Table 3.7: Summary statistics of innovativeness of incentive oriented and entrepreneurial programs for Years between 2008 and 2020

	Min	1st Qrt	Median	Mean	3rd Qrt	Max
Years incentive-oriented program is active for (TI)	5	31	40	42.1	51	88
Cumulative count of active incentive-oriented programs (CI)	2	15	24	25.5	33	72
Per capita spending on incentive-oriented programs ($) (EI)	0.55	11.0	18.4	30.1	29.2	254.3
Innovativeness score for incentive-oriented programs as a factor of program count (TI×CI)	10.0	552.0	951.0	1158.0	1459.0	5166.0
Innovativeness score for incentive-oriented programs as a factor of per capita program spending (TI×EI)	7.7	192.9	415.7	737.2	912.0	9096.2
Years entrepreneurial program is active for (TE)	0	10.3	21.5	20.3	29	46
Cumulative count of active entrepreneurial programs (CE)	0	0	1	1.6	3	7
Per capita spending on entrepreneurial programs ($) (EE)	0	3.5	7.6	19.7	17.5	367.9
Innovativeness score for entrepreneurial programs as a factor of program count (TE×CE)	0	16.3	36.5	49.9	77.5	175.0
Innovativeness score for entrepreneurial programs as a factor of program spending (in millions) (TE×EE)	0	0	5.8	20.2	26.3	651.4

The results show a statistically significant estimate for innovation in incentive-oriented programs (count-based measure) for both per capita GDP and per capita personal income. With the spending measure, I find statistical significance for personal income and innovativeness of incentive-oriented programs. For innovation in entrepreneurial programs, I find no statistically significant estimate for the count-based measure but I do find so for the spending-based measures. With statistical significance for the count-based measure, I find that a one unit increase in innovativeness in incentive-oriented programs may increase per capita GDP and

personal income by almost $7. I also find that, with statistical significance for the spending-based measure, a one unit increase in innovativeness of entrepreneurial programs may increase per capita GDP by $126 and per capita personal income by $79. The diagnostics (Table 3.9) also shows that the variables and models used were robust. The diagnostics reveal that all but model 2 in Table 3.8 are appropriate for fixed effect models. Model 2 is appropriate for a random effect model as the p-value for a fixed effect model is <1 for Hausman fixed vs. random effect testing (Table 3.9). Overall, the results suggest that innovativeness of incentive-oriented and entrepreneurial programs increase economic growth. However, I did not find statistical significance for count based entrepreneurial innovativeness and spending based incentive-oriented innovativeness for per capita GDP.

Table 3.8: Linear regression for GDP and Personal Income on Innovativeness of incentive-oriented and entrepreneurial programs

	(1) GDP	(2) GDP	(3) GDP	(4) GDP	(5) Income	(6) Income	(7) Income	(8) Income
	Fixed	Random	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Innovativeness 1 (-2)	6.72***				7.00***			
	(2.05)				(1.13)			
Innovativeness 2 (-2)		26.59				38.89		
		(32.23)				(28.52)		
Innovativeness 3 (-2)			0.52				2.22**	
			(1.15)				(1.02)	
Innovativeness 4 (-2)				125.62***				78.89**
				(41.45)				(37.95)
Per capita federal funding on transportation (-2)	7.01*	8.09*	5.05*	4.13	13.14***	19.37***	11.10***	10.72***
	(3.62)	(4.54)	(2.80)	(2.72)	(26.14)	(5.01)	(2.49)	(2.49)
Per capita state funding on higher education (-2)	4.69***	5.93***	1.30	0.48	3.61***	7.69***	1.14	0.94
	(1.20)	(1.69)	(1.03)	(1.04)	(1.01)	(1.62)	(0.92)	(0.95)
Per capita R&D expenditure in the state (-2)	273.20***	459.85***	-30.85	-23.54	240.05***	185.75*	87.42	100.30
	(78.18)	(114.34)	(70.53)	(67.72)	(65.81)	(100.22)	(62.53)	(62.01)
Waged and salaried employments per thousands of population	197.85***	182.34***	371.54***	365.35***	152.76***	173.01***	321.32***	320.62***
	(16.18)	(22.45)	(12.75)	(12.55)	(13.62)	(22.22)	(11.30)	(11.49)
State government ideology (-2)	-44.35	-78.39**	-14.94	8.95	-46.63*	-58.83*	-16.49	-18.68
	(31.06)	(36.40)	(23.30)	(19.59)	(26.15)	(31.32)		(17.93)
Innovativeness 1 (-2) * state ideology (-2)	0.052**				0.051**			
	(0.026)				(0.021)			
Innovativeness 2 (-2) * state ideology (-2)		2.01***				2.14***		
		(0.73)				(0.64)		
Innovativeness 3 (-2) * state ideology (-2)			-0.005				-0.027	
			(0.021)				(0.018)	
Innovativeness 4 (-2) * state ideology (-2)				-2.01***				-1.26**
				(0.65)				(0.60)
Overall Intercept	-52777.0***	-42868.0***	-120480.0***	-118050.0***	-38827.0***	-49805.0***	-105910.0***	-104980.0***
	(7732.0)	(10681.0)	(6212.3)	(6047.5)	(6508.8)	(10608.0)	(5507.5)	(5537.2)
Observations	283	147	235	235	283	147	235	235
Number of states	48	25	49	49	48	25	49	49
Adjusted R-squared	0.75	0.67	0.79	0.85	0.78	0.74	0.84	0.84

Significance codes: p<0.001 '***' p<0.01 '**' p<0.05 '*' Standard errors in parentheses GDP = per capital GDP, Income = per capital personal income

Innovativeness score: Innovativeness 1 = incentive oriented programs & program count, Innovativeness 2 = entrepreneurial programs & program count
Innovativeness 3 = incentive oriented & per capita program spending, Innovativeness 4 = entrepreneurial & per capita program spending

Table 3.9: Model diagnostics for economic growth and innovativeness of program types (Table 3.8)

	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 1)	(Model 2)	(Model 3)	(Model 4)
F test for individual effects								
Within vs. Pooling model	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001
Time-fixed effects	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001
Hausman Test for Panel models								
Fixed vs. Random effect	Fixed p<0.001	Fixed p<1	Fixed p<0.001	Fixed p<0.001	Fixed p<0.001	Fixed p<0.001	Fixed p<0.001	Fixed p<0.001
Regression based Hausman test	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.01	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001
Regression-based Hausman test, vcov: vcovHC	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001

* As the data is an unbalanced panel, the models do not account for time effects

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3.5 Program category

As shown in Table 3.5, incentive oriented programs are broadly two types: tax incentives and business finances. Tax incentives are provided in a number of ways, namely as tax credits, tax exemptions, and tax deductions. For the purpose of analyzing program categories, I have used broadly tax credits and tax exemptions. A tax credit is an incentive equal to the amount of tax for an income, whereas, a tax exemption discounts certain incomes as taxable income. Therefore, a tax credit is higher in amount than the exempted amount of tax. I have categorized tax deductions, tax rebates, etc. under tax exemptions as they are closer to a tax exemption than a tax credit. Another category of incentives is business financing. There are direct and indirect business financing. Direct financing is provided directly from the state government to incentive recipients. But, indirect financing uses an intermediate party (typically banks and relevant financial institutions) to channel the incentive from the government to business recipients. To keep the analysis simple, I have merged the direct and indirect business financing. These business finances can have several types such as grants, loans, business equity, and so on. The government also helps the businesses with the mechanisms of these financing methods such as getting loans from a third party, getting loans for a preferential rate, etc. Finally, community financing is provided to the local government body that implements projects to promote business entrepreneurship by infrastructural improvement, technical assistance, informational assistance, and the like (Table 3.10). These projects can also come as a grant, loan, or logistic support. The tax incentives, business finances, and community finance programs can overlap as well (Figure 3.7). Most of the community finance projects come as business finance (77 out of 145). Again, there are some programs (24) that fall under both tax incentives and business finances. However,

most of the programs are business finances, followed by tax incentive and community finances, which is only 7% of all programs.

Table 3.10: Examples of community projects

1. City streets	10. Power and communications facilities
2. County highways	11. Public Transit
3. State highways	12. Sewage collection and treatment
4. Drainage, water supply and flood control	13. Solid waste collection and disposal
5. Educational, cultural and social facilities	14. Water treatment and distribution
6. Environmental mitigation measures	15. Defense conversion
7. Goods movement-related infrastructure	16. Public safety facilities
8. Parks and recreational facilities	17. Military infrastructure
9. Port facilities, public transit	18. Industrial, utility and commercial

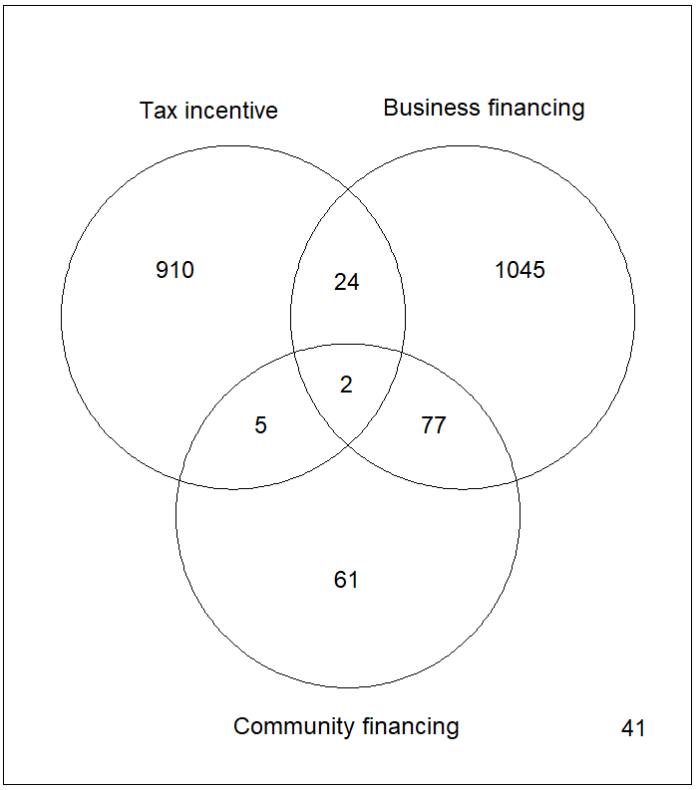

Figure 3.7: Venn diagram of overlapping programs among tax incentives, business finances and community finances

I use the same method to compute innovativeness of tax incentive, business finance, and community finance as innovativeness of incentive-oriented and entrepreneurial programs. I use program start year to determine the experience of the state with the program and cumulative count of the programs to determine the diffusion of the program within the state. Figure 3.8 presents diffusion characteristics of tax incentive and business finance programs and their comparisons. The diffusion of community finance projects is same as the diffusion of entrepreneurial programs presented in Figure 3.6. Tax incentives started in Utah in 1933 and business finance started in Pennsylvania in 1939. Today South Carolina and Kansas have the most tax incentive programs (55 each), although Kansas has more experience running since 1976 than South Carolina running since 1999. Among the big states, Texas and California have among the lowest numbers of tax incentive programs: five and eight respectively. Pennsylvania, Massachusetts, and Maryland are among the states that have high number of business finance projects, 59, 57, and 47 respectively. Business finance programs have been common in states since the 1950s. States that have many business finance programs started the programs earlier than the states that have less. I compute innovativeness for these three broad program categories. Computation and summary statistics are presented in Table 3.11. However, innovation does not necessarily happen at the broad level of the categories; rather, it happens at the level of program type in order to address new and changing demand from businesses (Please see Appendix Table A.1 for programs and the business needs they address). I do not account for innovativeness beyond these categories in this work because that will require developing a categorization scheme and future studies may look into finer levels of innovation. Nonetheless, I regress economic growth on these three broad categories to see their influence on economic growth.

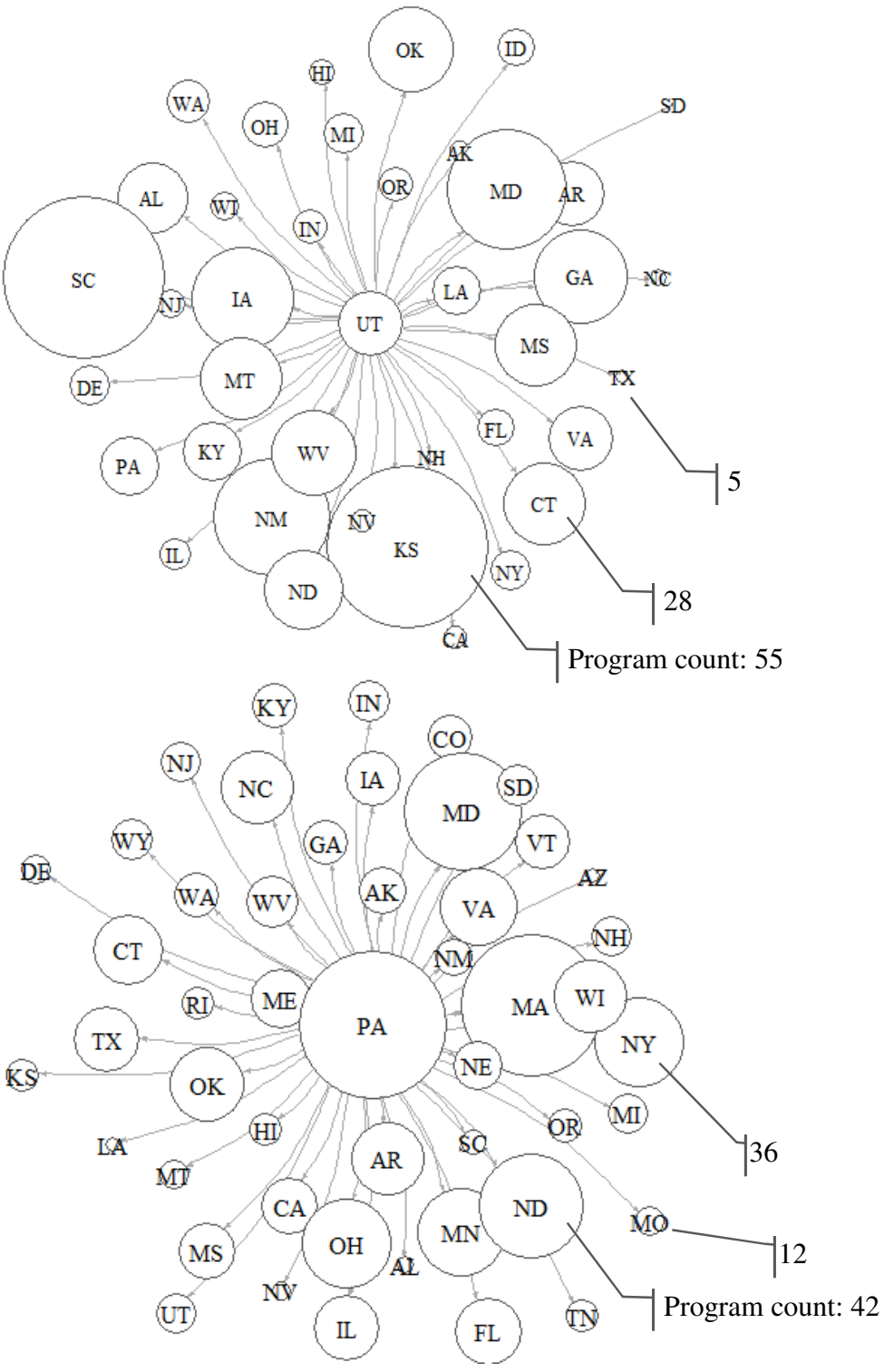

Figure 3.8: Diffusion and count in 2020 of Tax incentive programs starting 1933 (above) and business finance programs starting 1939 (below)

Table 3.11: Summary statistics of major program categories for Years between 2008 and 2019

	Min	1st Qrt	Median	Mean	3rd Qrt	Max
Years Tax Incentive is active for (TT)	0	21	30	30.5	36	88
Cumulative count of Tax Incentives (CT)	0	6	10	12.87	17	48
Innovativeness score for Tax Incentives (TT×CT)	0	152.0	357.0	437.0	591.0	1692.0
Years Business Finance is active for (TB)	0	27	37	38.7	50.3	82
Cumulative count of Business Finance (CB)	0	7	10	12.8	17	46
Innovativeness score for Business Finance (TB×CB)	0	203.0	384.5	586.7	650.0	3772.0
Years Community Finance is active for (TC)	0	10.3	21.5	20.3	29	46
Cumulative count of Community Finance (CC)	0	0	1	1.6	3	7
Innovativeness score for Community Finance (TC×CC)	0	16.3	36.5	49.9	77.5	175.0

I regress per capita GDP and per capita personal income on innovativeness based on count measures for tax incentives, business finances, and community finances. I did not use spending based measures for this analysis because of the categorization issues. I present the results in Table 3.12 and model diagnostics in Table 3.13. All but Model 3 are fixed effect models. I find statistically significant estimates for economic growth and innovativeness of tax incentive and business finance programs. I find that a one-unit increase in innovativeness of incentives may increase per capita GDP and personal income by over $10, which is over $7 for innovativeness in business finance programs. I find no significant estimate for community finance. Part of this may be due to a lack of data as only 25 states have community finance programs in the dataset. Nonetheless, I find all positive estimates for the relationship between

economic growth and innovativeness of tax incentives, business finances, and community finances.

This chapter deals with economic growth and policy diffusion. The innovativeness score embeds the characteristics of diffusion both across various states and within each state. The innovativeness score used accounts for the experience of a state with using a policy. The higher the experience the higher their innovativeness score. This experience, in other words, accounts for the level of diffusion of a policy. A policy that has been adopted more times is a more diffusive policy. Again, I also account for within state diffusion by taking account of how many programs have been adopted in the state. I find that the more policy diffusion of innovative policies, the more economic growth. It is true for two types of innovativeness and diffusion measures: 1) program count based measures and 2) program spending based measures. It is also true for various types of programs such as incentive oriented and entrepreneurial programs.

Table 3.12: Linear regression for GDP and Personal Income on Innovativeness of major program categories

	(1) GDP	(2) GDP	(3) GDP	(4) Income	(5) Income	(6) Income
	Fixed	Fixed	Random	Fixed	Fixed	Fixed
Innovativeness score for tax incentives (-2)	10.93*** (2.72)			12.07*** (2.39)		
Innovativeness score for business finance (-2)		7.37*** (2.28)			7.45*** (1.97)	
Innovativeness score for community finance (-2)			26.59 (32.26)			38.89 (28.52)
Per capita federal funding on transportation (-2)	11.93*** (4.26)	9.67*** (3.72)	8.09* (4.53)	14.04*** (3.73)	16.08*** (3.21)	19.37*** (5.01)
Per capita state funding on higher education (-2)	3.97** (1.57)	7.31*** (1.21)	5.93*** (1.69)	3.01** (1.37)	6.33*** (1.04)	7.69*** (1.62)
Per capita R&D expenditure in the state (-2)	245.08*** (84.57)	230.99*** (79.79)	459.85*** (114.34)	226.56*** (74.16)	193.43*** (68.89)	185.75* (100.22)
Waged and salaried employments per thousands of population	234.60*** (17.97)	202.53*** (16.86)	182.34*** (22.45)	184.36*** (15.75)	158.23*** (14.56)	173.01*** (22.22)
State government ideology (-2)	-67.43** (31.97)	-76.02*** (27.65)	-78.39** (36.40)	-67.97** (28.03)	-80.79*** (23.88)	-58.83* (31.32)
Innovativeness for tax programs (-2) * state ideology (-2)	0.20*** (0.060)			0.17*** (0.052)		
Innovativeness for business finance (-2) * state ideology (-2)		0.14*** (0.041)			0.14*** (0.035)	
Innovativeness for community finance (-2) * state ideology (-2)			2.01*** (0.73)			2.14*** (0.64)
Overall Intercept	-67303.0*** (8526.6)	-53651.0 (8066.6)	-42868.0*** (10681.0)	-50573.0** (7477.4)	-39864.0*** (6964.7)	-49805.0*** (10608.0)
Observations	225	283	147	225	283	147
Number of states	39	48	25	39	48	25
Adjusted R-squared	0.66	0.67	0.67	0.67	0.70	0.68

Significance codes: p<0.001 '***' p<0.01 '**' p<0.05 '*'
Standard errors in parentheses

Table 3.13: Model diagnostics for economic growth and program categories (Table 3.12)

	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)
F test for individual effects						
Within vs. Pooling model	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001
Time-fixed effects	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001
Hausman Test for Panel models						
Fixed vs. Random effect	Fixed p<0.001	Fixed p<0.001	Fixed p<1	Fixed p<0.001	Fixed p<0.001	Fixed p<0.001
Regression based Hausman test	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.01	Model is not inconsistent p<0.001
Regression-based Hausman test, vcov: vcovHC	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001

* As the data is an unbalanced panel, the models do not account for time effects.

CHAPTER 4

ECONOMIC DEVELOPMENT POLICIES, EFFECTIVENESS AND SPILLOVER

In this chapter, I examine whether entrepreneurial policies and incentive-oriented policies contribute to economic growth. For entrepreneurial policies, I examine if they positively impact economic growth and for incentive-oriented policies I examine if they contribute to leakage from the economy. Basically, entrepreneurial policies should contribute to economic growth because they are adopted according to the concurrent market demand. They have to be innovative in order to be able to address new demands in the market. Therefore, they should contribute to economic growth. On the other hand, incentive-oriented policies are adopted to recruit industrial branch plants in the states, so the revenue the branch plants generate may not stay in the host state, rather the revenue may flow elsewhere, such as where the headquarters are or where new investments may happen. Therefore, incentive-oriented policies should contribute to leakage from the state's economy.

4.1 Entrepreneurial policy and economic growth

Entrepreneurial policy promotes innovation in product developments and industrial processes leading to economic growth within the state (Figure 4.1). Entrepreneurial policies are meant for addressing new demands of the market; therefore, they have to be innovative.

Entrepreneurship capital is a kind of social capital that promotes knowledge spill over, diversity, and competition and work within the social capital to increase economic performance (Audretsch, Keilbach, and Lehmann 2006). Entrepreneurship capital increases knowledge spill over by introducing startup firms. It generates a variety of firms with new and competitive ideas and products. It also generates substantial competitions amongst the firms that exist and that are potential as the new firms need to bring in a new product, service, or idea. Knowledge spillover (Acs et al. 2004), diversity (Winter and Nelson 1982), and competition (Porter 1990) influence economic performance. This model assumes that regardless of innovativeness of the policy adoption, entrepreneurial policies contribute to economic growth because they promote innovation in industrial processing, finance systems, and technological development. With this, I hypothesize that entrepreneurial policies increase economic growth *(H2).* In Chapter 3, we see that innovativeness of entrepreneurial programs leads to economic growth. In this Chapter, I examine whether adoption of entrepreneurial programs (regardless of innovativeness) leads to economic growth. The models for *H2* will use all variables from models for *H1* presented in Table 3.1 and 3.3 in Chapter 3, and with the additional of interactions of entrepreneurial-ness of the policies and their innovativeness and survival.

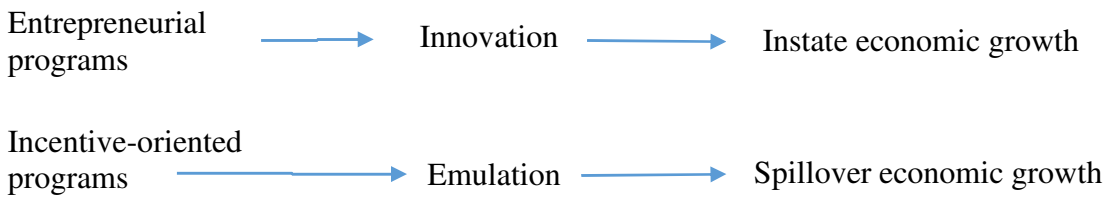

Figure 4.1: Hypothesized link among policy, diffusion, and economic growth

Table 4.1: Summary statistics of variables for *H2* for years between 2008 and 2020

	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum
Per capita GDP ($)	31602	43783	50545	52348	59136	91057
Per capita personal income ($)	29855	39260	44372	45577	50770	77289
Cumulative count of entrepreneurial programs	0	0	1	1.63	3	7
Per capita spending on entrepreneurial programs ($)	0	3.5	7.6	19.7	17.5	367.9
Per capita program spending ($) (E)	2.1	14.8	25.4	44.3	45.1	427.7
Per capita federal funding on transportation	3.6	117.8	154.5	192.6	200.8	1640.5
Per capita state funding on higher education	66.1	369.8	713.3	774.8	1062.8	2380.7
Per capita R&D expenditure in the state	0.17	2.5	4.5	6.0	8.1	24.7
Waged and salaried employments per thousands of population	385.6	436.5	464.6	467.4	493.6	650.6
State government ideology	17.5	26.9	44.5	44.1	61.1	73.6

I regress per capita GDP and personal income on entrepreneurial programs. I use count-based and spending-based measures and a lagged period of two years. Summary statistics of the variables are presented in Table 4.1. Table 4.2 presents the results of the models. I find that entrepreneurial programs increase economic growth in the count-based models. I find that one additional entrepreneurial program may increase $1,874 of per capita GDP and $2,071 of per capita personal income. I find no statistically significant estimates for spending-based measures. As discussed in section 3.4, the spending-based measure has some issues relate to categorization, which can possibly be the reason behind the null findings. I apply an alternative categorization scheme for spending-based measure and find a positive estimate for per capita GDP. This

suggests that a finer categorization of the spending functions should improve the model output. The alternative scheme is presented in Appendix: Table A.2 and A.3.

Table 4.2: Regression for GDP and personal income on entrepreneurial programs

	(Model 1) Per capita GDP	(Model 2) Per capita GDP	(Model 3) Per capita Personal Income	(Model 4) Per capita Personal Income
Cumulative count of entrepreneurial programs (-2)	1873.80** (865.37)		2070.98*** (775.55)	
Per capita spending on entrepreneurial programs (-2)		-5.30 (26.67)		-6.01 (26.84)
Per capita federal funding on transportation (-2)	13.56*** (4.45)	0.15 (1.75)	19.54*** (3.99)	1.97 (1.76)
Per capita state funding on higher education (-2)	7.92*** (1.47)	2.62*** (0.80)	6.81*** (1.32)	1.21 (0.80)
Per capita R&D expenditure in the state (-2)	305.34*** (94.83)	27.11 (47.42)	272.05*** (84.99)	145.22*** (47.72)
Waged and salaried employments per thousands of population	253.24*** (19.39)	350.68*** (8.89)	207.30*** (17.37)	305.32*** (8.95)
State government ideology (-2)	-55.75 (35.80)	-25.80* (14.84)	-62.34* (32.09)	-36.36** (14.93)
Program count (-2)* state ideology(-2)	18.74 (16.50)		22.58 (14.79)	
Program spending (-2)* state ideology(-2)		-0.13 (0.45)		-0.62 (0.46)
Overall Intercept	-77379.0*** (9230.4)	-110940.0*** (4402.5)	-62964.0*** (8272.4)	-95489.0*** (4430.7)
Observations	287	450	287	450
Number of states	49	50	49	50
Adjusted R-squared	0.60	0.80	0.54	0.79

Significance codes: p<0.001 '***' p<0.01 '**' p<0.05 '*'
Standard errors in parentheses

4.2 Industrial recruitment policies and spillover economic growth

Industrial recruitment policies bring out-of-state firms in the home state but the savings made from these firms move to other states leading to leakage in the economy of the home state (Figure 4.1). This model will see the relationship between industrial recruitment incentives and state-level leakage of income and industrial output. Doeksen and Little (1967) propose a measure to estimate regional leakage using an input-output table. An input-output table portrays the amount of interindustrial flow of goods and services. Leakage is measured using an interindustrial transfer multiplier and the state's net export-import balance. First, a technical input-output scenario is developed assuming that the host region is independent and receives no imported goods and services. Second, an interdependent input-output table is generated considering the changes in multipliers for the net export-import balance. Finally, leakage is calculated by deducting multipliers of the technical table from the interdependent table (Doeksen and Little 1967). In order to estimate the leakage, a modified input-output table is needed that represents input-output flow without any imports. After preparing the modified table, interdependent multipliers are computed from the original and modified tables. To estimate leakage, multipliers in the modified table are subtracted from the original level. Leakage happens when the change of economic activity in one state causes change in other states. I compute industrial multipliers from the national level industrial input-output flow (available from the BEA) and apply them to states based on the location quotient value for 19 aggregated industrial sectors of each state. I hypothesize that, as out-of-state firms are more likely to transfer earnings out of the host state and less likely to reinvest in the host-state, industrial recruitment policies should increase leakage *(H3).*

Table 4.3 : Main variables and data sources for H3

	Variables	Data Source and computation
Dependent variables	Output leakage	Computation from national direct requirement table from Bureau of Economic Analysis (BEA) and annual location quotient data for states from Bureau of Labor Statistics (BLS) BEA: https://www.bea.gov/data/industries/input-output-accounts-data BLS : https://www.bls.gov/cew/downloadable-data-files.htm
Independent variables	Incentive oriented programs	Council for Community and Economic Research (C2ER)
Control Variables	GDP	BEA
	Cluster Strength	Harvard Business School Cluster Mapping Project: https://clustermapping.us/data/report/region/scorecard#/state/48/1998/2018/cluster_strength
	Unionization	Harvard Business School Cluster Mapping Project: https://clustermapping.us/data/report/region/scorecard#/state/32/2001/2019/unionization

4.2.1 Computation of leakage

For the computation of leakage, I use national level input-output multipliers for the direct requirements (Table 4.4). In the input-output table, the multiplier is calculated in a way where total input is equal to total output. The requirement table shows how much input each sector requires from the own sector to produce a one unit of output. For example, in Table 4.4, Agriculture, forestry, fishing, and hunting has a direct requirement of 0.28, which means, in order to produce $1 of output, it uses 28 cents of its own input. So, the remaining 72 cents of inputs come from other industries. For manufacturing, the requirement is 1.44, which is over one, meaning that manufacturing does not need input (grossly) from other sectors rather, manufacturing provides input to other sectors more than what it needs for itself.

Table 4.4: National direct requirement for various industries for 2019

Industry code (BEA)	Industry title (BEA)	Industry code (BLS) (NAICS)	Industry title (BLS) (NAICS)	Direct requirement
11	Agriculture, forestry, fishing, and hunting	11	Agriculture, forestry, fishing and hunting	0.279356
21	Mining	21	Mining, quarrying, and oil and gas extraction	0.214851
22	Utilities	22	Utilities	0.175178
23	Construction	23	Construction	0.088475
31G	Manufacturing	31-33	Manufacturing	1.442441
42	Wholesale trade	42	Wholesale trade	0.402224
44RT	Retail trade	44-45	Retail trade	0.103634
48TW	Transportation and warehousing	48-49	Transportation and warehousing	0.452069
51	Information	51	Information	0.294015
FIRE	Finance, insurance, real estate, rental, and leasing	52	Finance and insurance	1.21104
FIRE	Finance, insurance, real estate, rental, and leasing	53	Real estate and rental and leasing	1.21104
PROF	Professional and business services	54	Professional and technical services	1.391921
PROF	Professional and business services	55	Management of companies and enterprises	1.391921
PROF	Professional and business services	56	Administrative and waste services	1.391921
6	Educational services, health care, and social assistance	61	Educational services	0.038438
6	Educational services, health care, and social assistance	62	Health care and social assistance	0.038438
7	Arts, entertainment, recreation, accommodation, and food services	71	Arts, entertainment, and recreation	0.155003
7	Arts, entertainment, recreation, accommodation, and food services	72	Accommodation and food services	0.155003
81	Other services, except government	81	Other services, except public administration	0.109303

For the computation of leakage from the state's economy, I need state level requirements. The Bureau of Economic Analysis (BEA) has a department named Regional Input-Output Modeling Systems (RIMSII) that computes state level requirements. However, they do not have time series data for state requirements. Based on their user manual and email correspondence with the responsible personnel for the computation of state level requirements, I learned they use state level location quotients (LQ) based on wages from the Bureau of Labor Statistics (BLS) and national level direct requirements to calculate state level requirements. Therefore, I compute state level requirements based on LQ for both wages and employment and apply those to national level direct requirements (Table 4.5). As an example, Table 4.5 shows the state level requirement for 19 industrial sectors for Alabama for 2019. A location quotient of 0.74 for Agriculture, forestry, fishing, and hunting means the concentration of this industry in Alabama is 74% in comparison to the national average concentration. When the value is over one, it means the concentration is higher in the state than the national average. From Table 4.5, wage based LQ for Agriculture, forestry, fishing, and hunting industry is 1.03, meaning that Alabama has slightly higher wages than the national average for this industry. Similarly, for employment based LQ for manufacturing, 1.57 means Alabama has 157% more employment in manufacturing than the national average of employment in manufacturing. So, when I multiply the national requirement which is indicative of overall input-output requirements with state level concentrations, I find how much the state requires from itself. Therefore, from Table 4.5, I interpret the requirement as Alabama requires $0.21 of input from the Agriculture, forestry, fishing, and hunting industry of Alabama to produce $1 of output in this industry. As the input should be equal to the output, the rest of the input comes from other industries inside or outside of Alabama. Therefore, the remaining input is the leakage from the industry. For Alabama's agriculture, forestry, fishing,

and hunting industry the leakage is 79 cents (employment based) or 71 cents (wage based) for every $1 of output.

Table 4.5: Location quotient (LQ) and state level requirements for Alabama for 2019

Industry title	LQ based on annual average employment	LQ based on total annual wages	State requirement (LQ employment X Direct requirement)	State requirement (LQ wages X Direct requirement
Agriculture, forestry, fishing and hunting	0.74	1.03	0.206723	0.287736
Mining, quarrying, and oil and gas extraction	0.7	0.66	0.150396	0.141802
Utilities	1.81	2.3	0.317073	0.40291
Construction	0.94	0.98	0.083167	0.086706
Manufacturing	1.57	1.59	2.264632	2.293481
Wholesale trade	0.94	0.98	0.37809	0.394179
Retail trade	1.1	1.16	0.113997	0.120215
Transportation and warehousing	0.83	0.93	0.375217	0.420424
Information	0.56	0.35	0.164648	0.102905
Finance and insurance	0.88	0.75	1.065716	0.90828
Real estate and rental and leasing	0.77	0.72	0.932501	0.871949
Professional and technical services	0.84	0.82	1.169214	1.141375
Management of companies and enterprises	0.5	0.5	0.695961	0.695961
Administrative and waste services	1.02	0.89	1.41976	1.23881
Educational services	0.49	0.43	0.018834	0.016528
Health care and social assistance	0.81	0.92	0.031134	0.035363
Arts, entertainment, and recreation	0.65	0.39	0.100752	0.060451
Accommodation and food services	0.99	0.93	0.153452	0.144152
Other services, except public administration	0.77	0.9	0.084163	0.098373
Average			0.515604	0.497979

In order to get the overall state level requirements, I summed all industry level state requirements and divided the sum by 19 (the number of total industrial sectors) to get an average state requirement for all industries (Table 4.6). Table 4.6 shows Alabama's overall requirement from industries outside the state for 2000 to 2019. So, for 2000, a requirement value of 0.47 (employment based) means Alabama requires 47% of its own input therefore the rest is leaked out of the economy. Again, for 2019, this employment-based leakage is 48.81% computed from (1 – 0.511865) * 100 = 0.488135 * 100 = 48.81%. I calculate leakage this way for all states from 2000 to 2019, and use this variable to test my hypothesis that incentive oriented programs increase leakage.

Table 4.6: Average State requirements for Alabama

Year	Sum of state requirement (employment based)	Sum of state requirement (wage based)	Average state requirement (employment based)	Average state requirement (wage based)
2000	9.014784	8.618571	0.474462	0.453609
2001	9.152895	8.791054	0.481731	0.462687
2002	8.978587	8.579453	0.472557	0.45155
2003	9.033626	8.760214	0.475454	0.461064
2004	9.058043	8.716084	0.476739	0.458741
2005	9.391027	8.986746	0.494265	0.472987
2006	9.347522	8.894037	0.491975	0.468107
2007	9.43726	8.950506	0.496698	0.471079
2008	9.611132	9.129673	0.505849	0.480509
2009	9.12296	8.643019	0.480156	0.454896
2010	9.408992	8.963893	0.49521	0.471784
2011	9.58073	9.114785	0.504249	0.479726
2012	9.720982	9.245719	0.511631	0.486617
2013	9.648082	9.196487	0.507794	0.484026
2014	9.796484	9.37904	0.515604	0.493634
2015	9.80909	9.370754	0.516268	0.493198
2016	9.778271	9.386878	0.514646	0.494046
2017	9.707065	9.351674	0.510898	0.492193
2018	9.792281	9.516411	0.515383	0.500864
2019	9.72543	9.4616	0.511865	0.497979

4.2.2 Variables and Model

My dependent variable for this hypothesis is leakage from the state's economy and the main explanatory variable is the number of and spending on incentive-oriented programs in the state. Table 4.7 shows summary statistics of the variables used in the model to test this hypothesis. My main independent variables are the count-based measure and the spending-based measure of incentive-oriented programs. For the count-based measure I use cumulative count of incentive oriented programs relative to all programs in the state. I use a cumulative count because all these programs are still active in the state. Therefore, a program starting in an earlier year still should have impact in the current year if it is active. For the spending measure, the value is the yearly expenditures on incentive-oriented programs. I use a per capita measure so that it can be comparable across states. I use four control variables: size of the economy, industrial composition, labor share, and state government's ideology in the model. Size of the economy should explain leakage because a larger economy is more likely to have investments in more variety of sectors within the economy causing a low rate of leakage from the economy. I use GDP as a proxy for the size of the economy. Industrial composition is related to whether the economy has a concentration of related industries that share input and output between themselves. If there is a higher concentration of related industries, leakage should be less, as the industries will need less input coming from the outside of the economy. I use cluster strength as the proxy of industrial composition. This cluster strength data comes from the Cluster Mapping Project of Harvard Business School. The cluster strength means how much employment is involved in the traded activities within the main cluster of the economy of a state. This means if there is a higher traded employment, there should be a higher chance of getting more revenue from outside of the state. It implies that the revenue from exports outside the state can have a

higher chance of outweighing the spending for inputs outside the state. Therefore, higher cluster strength should decrease leakage. The cluster strength of each state will be discussed in more detail in Chapter 5. I also use labor strength as a control variable. However, labor strength may be related to leakage depending on the type of the industry. For labor intensive industries, labor strength should decrease leakage because the industry will hire more from instate workers. However, for capital intensive industries, the labor strength variable may not be related. I do not have a category for labor vs. capital intensity of the industries. So, this variable separately may not explain anything but its impact on the overall model is addressed by using this variable. I have used unionization as a proxy of the labor strength. I also use ideology as a control variable. Similar to unionization, liberal policies should be more beneficial to labor and may have an impact on the labor-intensive industries. Again, liberal policies that involve environmental regulation may affect the profitability of the capital-intensive manufacturing industries. Conservative policies that involve more deregulation should benefit the industries regardless of the type. I also use an interaction of ideology and program to see how ideology and program choice may have a role to play in the model.

The results in Table 4.8 show incentive-oriented programs increase leakage. I find significant estimates for the count-based measures but no significant estimates for the spending-based measures but the estimates are in the right direction. I find size of the economy and cluster strength always decrease leakage. However, cluster strength is not statistically significant. I also find unionization to increase leakage (although not significant) and ideology to increase leakage (significant in the count-based measures). These results suggest liberal policies increase leakage, although I did not find statistical significance in the spending-based models. However, an interaction of ideology and program choice always decreases leakage. I find this estimate

statistically significant for all but Model 4. I also do diagnostics for the models and variables (Table 4.9). I find a within model with state effects more suitable than a pooling model with all states together. I also find models for fixed state effects are more suitable than random effect models. The variables are robust as diagnosed by the Hausman test both in terms of regression based and covariance-based tests.

Table 4.7: Summary statistics of variables for modeling leakage and incentive-oriented programs for years between 2008 and 2020

	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum
Leakage (%) based on employment	19.4	44.0	46.5	47.2	49.9	63.2
Leakage (%) based on wage	24.0	44.5	47.2	47.9	50.6	62.5
Cumulative count of incentive oriented programs	2	15	24	25.45	33	72
Cumulative count of incentive oriented and entrepreneurial programs	2	16	25	27.1	34	75
Cumulative Number of incentive oriented programs relative to all programs	0.7	0.9	1.0	0.9	1.0	1.0
Per capita Spending on incentive oriented programs ($)	0.6	11.0	18.4	30.1	29.2	254.3
Current GDP ($M)	25668	83410	207485	343372	414926	3132801
Industrial composition (cluster strength (%))	11	27.1	38.1	38.0	49.2	68.7
Unionization (%)	1.5	5.1	9.2	9.4	12.8	22.8
State government ideology	17.6	26.9	44.6	44.1	61.1	73.6

Table 4.8: Regression for leakage on incentive oriented programs.

	(Model 1) Leakage based on employment	(Model 2) Leakage based on employment	(Model 3) Leakage based on wages	(Model 4) Leakage based on wages
Cumulative count of incentive programs relative to all programs (t-2)	26.96** (10.94)		29.71** (11.58)	
Per capita spending on incentive oriented programs (t-2)		0.014 (0.015)		0.008 (0.016)
Size of the economy (log of GDP) (t-2)	-7.59*** (1.36)	-10.22*** (0.91)	-6.18*** (1.45)	-8.82*** (0.97)
Industrial composition (cluster strength (%))	-0.034 (0.022)	-0.007 (0.013)	-0.026 (0.023)	-0.003 (0.014)
Unionization (%)	0.18 (0.14)	0.010 (0.091)	0.16 (0.15)	0.044 (0.096)
State ideology (t-2)	0.19** (0.084)	0.018 (0.012)	0.45** (0.19)	0.019 (0.013)
State ideology * program count	-0.20** (0.095)		-0.46** (0.20)	
State ideology * program spending		-0.0005* (0.0003)		-0.0004 (0.0003)
Overall Intercept	113.27*** (21.01)	170.77*** (11.46)	93.92*** (22.23)	153.96*** (12.15)
Observations	266	397	266	397
Number of states	49	50	49	50
R-squared	0.22	0.34	0.17	0.26

Significance codes: p<0.001 '***' p<0.01 '**' p<0.05 '*'
Standard errors in parentheses

Table 4.9: Model diagnostics for leakage and incentive-oriented programs (Table 4.8)

	(Model 1)	(Model 2)	(Model 3)	(Model 4)
F test for individual effects				
Within vs. Pooling model	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001
Time-fixed effects	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001
Hausman Test for Panel models				
Fixed vs. Random effect	Fixed p<0.001	Fixed p<0.001	Fixed p<0.1	Fixed p<0.001
Regression based Hausman test	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001
Regression-based Hausman test, vcov: vcovHC	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.01	Model is not inconsistent p<0.001

* As the data is an unbalanced panel, the models do not account for time effects.

This chapter examines the effect of entrepreneurial and incentive-oriented policies on the economic performance of the states. As entrepreneurial policies help business startups, they need to be innovative with respect to the concurrent demand in the market. As they address the demand in the market, they increase economic growth. I find statistically significant evidence that entrepreneurial policies increase economic performance. On the other hand, industrial recruitment policies are meant for recruiting branch plants of reputed firms that have operations and headquarters in other states. Although those firms operate in one state, the revenue they generate can move to other states. Leakage is the measure to show how much of the intermediate input each industry receives from outside the economy. This intermediate input gets leaked from the economy. As industrial recruitment policies encourage branch plants that are more likely to

bring intermediate inputs from outside the economy, they increase leakage. I find statistically significant evidence that industrial recruitment policies increase leakage.

However, I do not find any statistically significant estimates for the measures that are based on program spending. This is probably due, in part, on the way I define entrepreneurial programs in the spending dataset. The dataset does not have recorded information for entrepreneurial policies exclusively. Therefore, there are overlaps of incentive oriented and entrepreneurial spending in the dataset. At the moment, the spending measure is not very reliable as there are overlaps but if with separated entrepreneurial spending data the spending measure should bring more reliable estimates. In this chapter, I tested the hypotheses using spending data in the model. With more specific data, these models can produce more reliable estimates.

CHAPTER 5

POLICYMAKING AND THE EFFECT OF INDUSTRIAL SPECIALIZATION

The strongest industry in a state is its best industrial specialization. However, a state can have multiple industrial specializations. The size of agglomeration of related firms in an industry defines the strength of the industry relative to that industry across the nation and relative to other industries within the state. The bigger the size of the agglomeration for a particular industry, the more specialized the host state is for that industry. I examine this specialization relative to other states. This industrial specialization is also analyzed as "clusters of related industries," especially in the regional science literature. A cluster simply is the geographic agglomeration of related industries. The geograhic agglomeration helps facilitate competition among the related firms because they can share information and resources (Porter 1998). The process of diffusion is also high withih a cluster. Policies that are adopted for a technolgy cluster—availability of similar technology in an area or at a period of time— diffuse at a higher speed than average (Mallinson 2016). In other words, a cluster of industries adopts innovative policies quickly. Adoption of one innovative policy influences adoption of other related policies (Rogers 2003). Therefore, a cluster facilitates innovation, diffusion, and competion, which are all important forces for economic performance. In order for the cluster to grow economically, it is important that the government focus on the cluster characteristics and accordingly support more R&D activities, more new venture projects, more scientific activities, and the like (Porter 1998).

In this chapter, I examine if the state's policy compatibility with its strong industries influences economic growth in the state. I test the hypothesis that policies consistent with the industry that a state specializes in should promote the state's economic growth. To define industrial specialization, I use a location quotient (LQ) value for each industry within a state. The location quotient value indicates the concentration of an industry relative to the national average concentration in a state in terms of employment or wage in that industry. This industrial concentration is also described as clusters (U.S. Cluster Mapping Project 2020). Clusters are geographic areas consisting of related firms that are connected to each other through some forward and backward linkages. So, I examine if the economic development policies adopted by a state support the cluster broadly and the cluster type particularly. I examine whether the states adopt policies that are congruent to their cluster/industrial characteristics. I measure this congruence by taking account of the industry target of the adopted policies. I count how many policies have been targeted to each industry for each state by year. Then I apply the number of policies targeted to an industry to the location quotient value of that industry to get a congruence score for that industry. I do this for 19 industrial categories for each state. Finally, I get an aggregate congruence score by summing up congruence scores for all industrial categories for each state by year. With this aggregate congruence score, I test whether policy congruence, i.e., policy relevance to the industrial concentration of the state, increases economic growth. In short, I hypothesize that policy congruence should increase economic growth *(H4).*

I use two dependent variables: GDP per capita and personal income per capita (Table 5.1). I have two main independent variables: congruence calculated with an employment based LQ and that calculated with a wage based LQ. I use the following control variables: spending on entrepreneurial programs, per capita federal funding on transportation, per capita state's funding

on education, R&D expenditures in the state, total employment in the state, and state ideology. I also use an interaction term for the main independent variables and state ideology.

Table 5.1: Main variables and data sources for Hypothesis 4: policy congruence increase economic growth

	Variables	Data Source and computation
Dependent variables	GDP Personal Income	Bureau of Economic Analysis (BEA)
Independent variables	Policy congruence: the state's target industries for the adopted policies and it's industrial concentration (LQ)	Target Industry: Council of Community and Economic Research (C2ER) LQ: Bureau of Labor Statistics Congruence = count of programs targeted to an industry * LQ of that industry
Control Variables	Entrepreneurial spending	C2ER
	Federal funding on transportation	NASBO
	State funding on education	NASBO
	Employment	BEA
	State Ideology	(Berry et al. 2010)

5.1 Policy congruence

More specifically, policy congruence is meant for how related the policy adopted is to the strong industries in the state. When an economic development policy is adopted in a state, the policy is sometimes targeted to one or multiple industries. The C2ER data that I am using for economic development policies has recorded 965 out of 2165 policies with a target industry. So, I have 965 policies that have a target industry. Now I want to see if those policies are targeted to an industry that is a strong industry in the state (Figure 5.1). Figure 5.1 shows the two top

industries in each state with their respective location quotient value for 2019. The third top industries in each state in 2019 is presented in the Appendix (Figure A.1). Figure 5.1 presents the industrial concentration of the top two industries for 2019. Similarly, the data includes yearly industrial concentration for 19 industrial categories by state. To identify the strength of the industry, I use this location quotient value that denotes the relative concentration of an industry in the state relative to the country (Table 5.2). I use this industrial strength to identify if the policies adopted in the state is targeted to this strength. Table 5.2 presents an example for Alabama for 2019 on how to calculate congruence. In Table 5.2, the employment based LQ for agriculture, forestry, fishing, and hunting industry in 2019 for Alabama is 0.74. There was no policy adopted targeting this industry in 2019 but there is one active program that has been targeted to this industry. Therefore, the congruence value for this industry is 0.74 X 1 = 0.74. Using this method, I have this congruence value for each industry. So, I sum up the congruence values for all industries to get a final congruence score for the state for a year. I have program data for 2008 to 2019, so, I have policy congruence for this 12-year period for all states. Table 5.3 shows an example for Alabama. I have no data for Alabama for 2008, 2010, 2013, and 2014[1]. So, those years are omitted from the model.

[1] Only 45% of the programs have information on the target industries, therefore, there is not a congruence value available in all state-years.

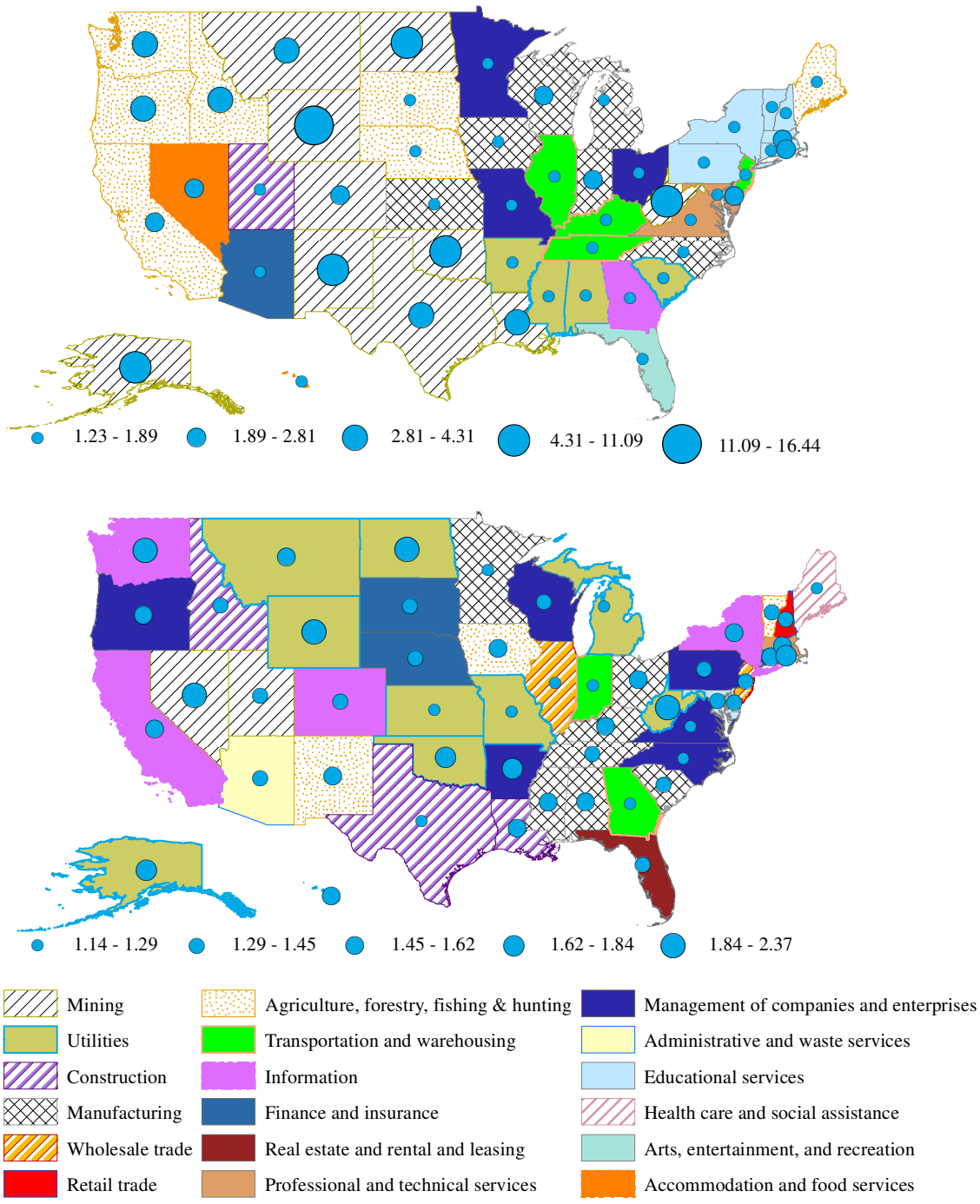

Figure 5.1: Top industries in the American states in 2019 (above – top, below – second top). Circle markers indicate location quotient for the respective industry in the state

Table 5.2: Location quotient (LQ) and industry level policy congruence for Alabama for 2019

1	2	3	4	5	6
Industry title	LQ based on annual average employment	LQ based on total annual wages	Cumulative program count	Congruence (employment) = Col 2 x Col 4	Congruence (Wage) = Col 3 x Col 4
Agriculture, forestry, fishing and hunting	0.74	1.03	1	0.74	1.03
Mining, quarrying, and oil and gas extraction	0.7	0.66	0	0	0
Utilities	1.81	2.3	0	0	0
Construction	0.94	0.98	0	0	0
Manufacturing	1.57	1.59	0	0	0
Wholesale trade	0.94	0.98	0	0	0
Retail trade	1.1	1.16	0	0	0
Transportation and warehousing	0.83	0.93	3	2.49	2.79
Information	0.56	0.35	0	0	0
Finance and insurance	0.88	0.75	0	0	0
Real estate and rental and leasing	0.77	0.72	0	0	0
Professional and technical services	0.84	0.82	1	0.84	0.82
Management of companies and enterprises	0.5	0.5	0	0	0
Administrative and waste services	1.02	0.89	0	0	0
Educational services	0.49	0.43	0	0	0
Health care and social assistance	0.81	0.92	0	0	0
Arts, entertainment, and recreation	0.65	0.39	0	0	0
Accommodation and food services	0.99	0.93	0	0	0
Other services, except public administration	0.77	0.9	0	0	0
Total				4.07	4.64

Table 5.3: Congruence score for Alabama for 2008 - 2019

Year	Sum of congruence (employment based)	Sum of congruence (wage based)
2008	NA	NA
2009	2.62	2.68
2010	NA	NA
2011	3.32	3.73
2012	3.34	3.71
2013	NA	NA
2014	NA	NA
2015	3.3	3.71
2016	4.14	4.64
2017	4.08	4.61
2018	4.07	4.62
2019	4.07	4.64

Similar to the models in the previous chapters, I run linear regression for panel data models with the above mentioned (Table 5.1) dependent, explanatory, and control variables. Table 5.4 shows the summary statistics of the variables and Table 5.5 shows the model outputs. I use a two-year lagged period for all the independent variables as I assume that there is a need for a 2-year time for program level interventions and government ideology to make an impact on economic growth. I did not use any lagged period for number of employments because I assume that employment has an immediate impact on GDP and personal income. I use spending on entrepreneurial programs as a control variable as discussed in the previous chapter that entrepreneurial programs increase GDP. As discussed in the previous chapters, spending on infrastructure, spending on worker skills, and number of employments directly influences GDP. I use federal spending on transportation as a proxy for the infrastructure spending. I did not use the state's spending on infrastructure separately because that may cause a chance of duplication for

number of programs and spending on entrepreneurial programs might also include some spending on infrastructure. I use state spending on higher education as a proxy for worker skill in the state. I also use state ideology as a control variable because government's choice on program adoption may depend on the ideology of the government. I also use an interaction of ideology and government's policy choices to address any effect of the interaction in the model.

Table 5.4: Summary statistics of variables for modeling economic growth and policy congruence for years between 2008 and 2020

	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum
Per capita GDP ($)	31602	43783	50545	52348	59136	91057
Per capita personal income ($)	29855	39260	44372	45577	50770	77289
Policy congruence (LQ employment)	0	6.89	16.6	21.3	33.0	108.6
Policy congruence (LQ wages)	0	7.1	16.7	21.7	34.2	120.8
Per capita spending on entrepreneurial programs ($)	0	3.5	7.6	19.7	17.5	367.9
Per capita federal funding on transportation	3.6	117.8	154.5	192.6	200.8	1640.5
Per capita state funding on higher education	66.1	369.8	713.3	774.8	1062.8	2380.7
Per capita R&D funding in the states	0.17	2.5	4.5	6.0	8.1	24.7
Waged and salaried employments per thousands of population	385.6	436.5	464.6	467.4	493.6	650.6
State government ideology	17.6	26.9	44.6	44.1	61.1	73.6

Table 5.5: Regression for GDP and personal income on policy congruence

	(Model 1) Per capita GDP	(Model 2) Per capita GDP	(Model 3) Per capita Personal Income	(Model 4) Per capita Personal Income
Policy congruence (LQ employment) (-2)	150.08*** (43.42)		159.96*** (35.06)	
Policy congruence (LQ wages) (-2)		138.74*** (44.17)		158.19*** (35.48)
Per capita spending on entrepreneurial programs (-2)	27.61* (15.90)	26.59 (16.15)	2.08 (12.83)	2.14 (12.98)
Per capita federal funding on transportation (-2)	1.30 (2.59)	1.23 (2.64)	6.60*** (2.09)	6.19*** (2.13)
Per capita state funding on higher education (-2)	0.96 (0.94)	1.04 (0.95)	1.15 (0.0.76)	1.23 (0.77)
Per capita R&D funding in the state (-2)	-6.98 (65.04)	-10.84 (66.14)	109.40** (52.52)	106.34** (53.12)
Waged and salaried employments per thousands of population	353.59*** (12.49)	356.25*** (12.61)	296.73*** (10.09)	298.96*** (10.13)
State government ideology (-2)	5.10 (23.86)	4.17 (24.35)	-14.43 (19.27)	-13.02 (19.56)
Policy congruence employment (-2) * state ideology(-2)	-0.70 (0.98)		-0.19 (0.79)	
Policy congruence wages (-2)* state ideology(-2)		-0.74 (1.00)		-0.34 (0.80)
Overall Intercept	-114820.0*** (6135.0)	-115810.0*** (6205.1)	-96362.0*** (4953.7)	-97315.0*** (4984.3)
Observations	235	235	235	235
Number of states	49	49	49	49
Adjusted R-squared	0.87	0.86	0.89	0.89

Significance codes: p<0.001 '***' p<0.01 '**' p<0.05 '*'
Standard errors in parentheses

I find that policy congruence increases economic growth in the state (Table 5.5). For both GDP and personal income and for both employment-based and wage-based congruence measures, I find statistically significant estimates. The estimates suggest that a one unit increase

in congruence should increase per capita economic growth by nearly $150. In other words, if a state adopts one policy for an industry that has an LQ of one, per capita economic growth will increase by $150, which is equivalent to adopting two policies for an industry that has an LQ of 0.5. The estimates for the control variables also seem to be in the right direction although not all of them were found to be statistically significant.

Table 5.6: Model diagnostics for economic growth and policy congruence (Table 5.5)

	(Model 1)	(Model 2)	(Model 3)	(Model 4)
F test for individual effects				
Within vs. Pooling model	Within p<0.001	Within p<0.001	Within p<0.001	Within p<0.001
Time-fixed effects	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001	Significant time effect* P<0.001
Hausman Test for Panel models				
Fixed vs. Random effect	Fixed p<0.001	Fixed p<0.001	Fixed p<0.001	Fixed p<0.001
Regression based Hausman test	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001
Regression-based Hausman test, vcov: vcovHC	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001	Model is not inconsistent p<0.001

* As the data is an unbalanced panel, the models do not account for time effects.

I run model diagnostics (Table 5.6) to see whether 'within' effects (the state's fixed effects) needs to be addressed, and I find that 'within' models are more appropriate for the data. I also find there is a time-effect within the data, but I did not address time effect as the years of the data is small, with a maximum of 12 years. I also test whether random effects need to be

addressed. I find that fixed effect models are more suitable for the data. I also perform Hausman tests to diagnose if the variables in the models are robust enough for the regression model and for the data I have in terms of variable covariance and heteroskedasticity. I find that the variables I choose are robust given the models used and given the characteristics of the data.

This chapter deals with examining which industries the policies should target in a state. This chapter identifies if it is better to adopt policies that are adopted in a homophilous state or to adopt policies depending on the industrial characteristics of the own state. From the findings of the models, the results suggest states need more policies for the industries that they specialize in. The state governments should adopt policies for their high LQ industries to increase economic growth of the state. However, there is one problem of the LQ based measures and that is LQ is measured based on spatial jurisdiction but clusters can essentially cross any administrative boundary (Woodward 2012). So finer LQ data, say county level data, will potentially produce more accurate estimates.

CHAPTER 6

CONCLUSION

States adopt economic development policies with the hope of increasing state economic performance. However, in order for the policies to be effective, the state must consider various policy dimensions of the adoptable policies. I find as past studies suggest that all policies do not effectively contribute to the economic growth. Policies that are innovative contribute to economic growth. Policies that are meant for the local economy and compatible with the local characteristics can contribute to economy. That is, policies that are compatible with the industrial characteristics of the local economy contribute to economic growth. Policies that assist the community grow its entrepreneurship from within can also contribute to economic growth. However, policies that are meant for recruiting out-of-state firms do not contribute to economic growth of the local economy. In this study, I find that industrial recruitment incentives contribute to leakage from the economy.

I test four hypotheses in this dissertation that reveal these findings. First, I test whether innovativeness in program adoption contributes to economic growth. I hypothesize that no matter the policy type, if it is an innovative one, it will contribute to economic growth (*H1*). My second question is whether entrepreneurial policies contribute to economic growth. For this question, I hypothesize that no matter how innovative the entrepreneurial policy is, it should contribute to

economic growth (*H2*). Thirdly, I ask whether incentive-oriented policies contribute to leakage from the economy to other locations. I hypothesize that incentive-oriented policies should contribute to leakage from the economy (*H3*). Finally, my fourth question is whether the policies that are compatible with the industrial characteristics of the home economy contribute to economic growth. My fourth hypothesis is policies that are congruent to the industrial characteristics of the economy should contribute to the economy.

For the first question, I use GDP and personal income as the dependent variables. I use innovativeness as the main independent variable. Innovativeness is a measure for individual programs in terms of the earliness in adopting a new program and the degree of diffusion of that program within the economy. I examine whether innovativeness of program adoption contributes to GDP growth and personal income growth. I compute innovativeness using a state's experience in operating specific types of programs and 1) the state's yearly cumulative count of that type of programs, and 2) the state's yearly expenditure on that type of programs. I use these two innovativeness measures once for all programs together without categorizing them and then with two levels of categorization. At the first level, there are two types of programs: incentive-oriented and entrepreneurial. At the second level, there are three types of programs: two from the incentive-oriented programs – tax incentives and business finance, and one from the entrepreneurial programs – community finance. I find statistically significant evidence that the count-based innovativeness of all programs, incentive-oriented, entrepreneurship oriented, tax incentive, business finance, and community finance programs positively contribute to per capita GDP and per capita personal income. That innovativeness of programs positively influences economic growth also holds applying the 'policy congruence' variable as a control in the model

(Please see Appendix Table A.4). In short, I find that innovativeness contributes to economic growth.

However, for the innovativeness based on program spending, I do not always find statistically significant estimates. Although the program count data and program spending data come from the same source (The council for Community and Economic Research (C2ER)), these are two separate datasets. There are some potential causes behind why I find different results for using different datasets for my measures. First, I use cumulative count of programs from the dataset that is a list of currently active programs (2,165 programs) in the states and territories. I use their start year as the base to compute how long these programs have been active in the states. I determine the number of programs that have been active in the states each year. I also compute how much experience the states have with using a specific program. On the other hand, for the spending data, I have yearly expenditures on the programs. There must be some programs in the spending data that have not continued to a later year. So, when I use program experience to compute innovativeness on spending data, the score potentially misses some programs. If I had start year data associated with the program spending data, the results using the program spending data could have been different. Secondly, in the count data, the program categories are understandably separate from each other such as incentive-oriented, entrepreneurship, tax incentives, business finance, community finance, etc. Although there are some programs that fall under two categories as mentioned in the discussion of the dataset in Chapter 3. The spending data, however, has a different scheme of categories, and the categories are such that many categories may fall under both incentive and entrepreneurship-oriented programs. The basic distinction between incentive-oriented and entrepreneurial programs that I use is incentive programs are for private parties and entrepreneurship-oriented programs are for the community.

But there are programs that can fall into either category depending on the way they are defined. For example, funding for workforce development and preparation, I use this as an incentive-oriented program because this funding goes to firms. However, if the firm uses the money on the workers for developing any transferable skills that they can use later at another local firm, this funding can be regarded as entrepreneurial funding. Using a different scheme of categories may produce different results of the estimates. I have an alternative scheme of categories and I present the results based on that category in the Appendix (Table A.2).

For the second question, whether entrepreneurial programs contribute to economic growth, I also use per capita GDP and personal income as dependent variables and a cumulative count of entrepreneurial programs as the main independent variable. I find again statistically significant estimates for the count-based measure and insignificant estimates for the spending based measure. Although the spending-based measure has some issues as discussed in the last paragraph, the count-based measure shows that entrepreneurial programs increase economic growth. I find positive relationships for both per capita GDP and personal income.

For the third question, whether incentive-oriented programs increase leakage from the economy, I use leakage as the dependent variable and a cumulative count of incentive-oriented programs as the main independent variable. The U.S. Bureau of Economic Analysis calculates State level leakage year to year, but they do not have time series data. I use their computational approach to calculate leakage for the states over time using the same data sources (Bureau of Labor Statistics) as they do. Leakage is the measure of how much each state spends for industrial intermediate inputs from sources outside its own economy. I hypothesize that this leakage increases if a state spends more to recruit firms from outside the state. I find statistically significant estimates that incentive-oriented policies increase leakage.

Finally, in order to test whether policies congruent to the industrial strength of a state has a positive influence over its economy, I use the same per capita GDP and personal income measures as dependent variables and a measure of policy congruence as the main independent variable. In order to measure policy congruence, I use the C2ER program data, which records the target industry for each program. I calculate whether the targeted industry is the strongest industry of that state. To compute congruence, I apply how many programs are adopted for a specific industry to what is the location quotient (the relative strength of an industry in the country) of that industry for the state. I expect that economic growth should be higher if this congruence score is higher. I find the results according to my expectation: congruent policies contribute to economic growth for both GDP and personal income.

States adopt economic development policies to improve the performance of the economy. A large portion of such policies is incentive-oriented policies. Scholars find that incentive-oriented policies do not contribute to economic growth (Langer 2001; Leicht and Jenkins 1994). In this dissertation, I build on these findings to see what other dimensions of economic development policies may help explain economic performance. I find several key dimensions of the policies that are beneficial to the economy and a few other dimensions that are not. Entrepreneurial programs are beneficial to the economy. Incentive-oriented programs are beneficial only under certain conditions. As the results suggest, incentive-oriented policies are beneficial to the state's economy, only if they are innovative and only if they are congruent to the industrial strength of the state. The results also suggest that the states must be cautious in adopting incentive-oriented policies as they cause leakage from the economy. The states should target industries carefully when adopting incentive-oriented policies making sure they will use more of the local resources than resources outside of the state. Finally, the results also suggest

that the states need to keep adopting entrepreneurial policies that improve the local resources and local capabilities so that firms can grow from within and reinvest the revenue they generate in a way that eventually brings more revenue to the state.

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APPENDIX

Table A.1: Economic development programs and business needs addressed in the American states

Business needs addressed	Number of programs
Capital access or formation	400
Tax/Regulatory burden reduction	388
Workforce prep or development	98
Capital access or formation, Tax/Regulatory burden reduction	69
Capital access or formation, Facility/site location	60
Product & process improvement, Tax/Regulatory burden reduction	57
Facility/site location, Tax/Regulatory burden reduction	55
Infrastructure Improvement	49
Facility/site location	37
Workforce prep or development, Tax/Regulatory burden reduction	37
Tax/Regulatory burden reduction, Facility/site location	36
Tech & product development, Tax/Regulatory burden reduction	36
Capital access or formation, Infrastructure Improvement	32
Capital access or formation, Product & process improvement	28
Capital access or formation, Tech & product development	25
Tax/Regulatory burden reduction, Workforce prep or development	2

Table A.2: An overview of spending on various economic development functions in the spending dataset of C2ER

Economic Development programs ($223.7M)	Incentive-oriented ($136.0M)	Business finance ($0.22M)
		Strategic business attraction fund (0)
		Business assistance ($6.14M)
		International trade and investment (0)
		Domestic recruitment/out-of-state (0)
		Workforce preparation and development ($11.77M)
		Technology transfer ($0.55M)
		Entrepreneurial development (0)
		Tourism/film ($21.34M)
		Special industry assistance ($16.76M)
	Entrepreneurial ($109.1M)	Workforce preparation and development ($11.77M)
		Entrepreneurial development (0)
		Minority business development (0)
		Community assistance ($25.44M)
		Tourism/film ($21.34M)

Note. Figures in the parentheses indicate spending of the median state in 2020

Table A.3: Regression for GDP and personal income on entrepreneurial programs for entrepreneurial spending based on the categorization scheme in Table A.2

	(Model 1) Per capita GDP	(Model 2) Per capita Personal Income
Per capita spending on entrepreneurial programs (-2)	4.26	-2.88
	(2.44)	(24.56)
Per capita federal funding on transportation (-2)	0.27	1.97
	(1.75)	(1.77)
Per capita state funding on higher education (-2)	2.61***	1.17
	(0.80)	(0.81)
Per capita R&D expenditure in the state (-2)	29.30	148.98***
	(47.42)	(47.84)
Waged and salaried employments per thousands of population	350.63***	304.70***
	(8.89)	(8.97)
State government ideology (-2)	-27.32*	-36.78**
	(15.35)	(15.49)
Program spending (-2)* state ideology(-2)	-0.11	-0.52
	(0.42)	(0.43)
Overall Intercept	-111050.0***	-95219.0***
	(4404.9)	(4443.4)
Observations	450	450
Number of states	50	50
Adjusted R-squared	0.80	0.78

Significance codes: p<0.001 '***' p<0.01 '**' p<0.05 '*'
Standard errors in parentheses

Table A.4: Linear regression for GDP and personal income on innovativeness and policy congruence

	(Model 1) Per capita GDP	(Model 2) Per capita Personal Income
Innovativeness score as a factor of program count (-2)	5.78***	5.64***
	(1.35)	(1.11)
Policy congruence (employment) (-2)	59.36*	88.38***
	(31.03)	(25.68)
Per capita federal funding on transportation (-2)	5.44	10.93***
	(3.67)	(3.04)
Per capita state funding on higher education (-2)	4.62***	3.50***
	(1.20)	(0.99)
Per capita R&D expenditure in the state (-2)	281.39***	254.16***
	(78.01)	(64.56)
Waged and salaried employments per thousands of population	195.74***	150.23***
	(16.13)	(13.35)
State government ideology (-2)	-38.54	-41.36
	(31.15)	(26.39)
Innovativeness (count) (-2)* state ideology(-2)	0.045**	0.044**
	(0.025)	(0.020)
Overall Intercept	-51992.0***	-37818.0***
	(7696.9)	(6369.8)
Observations	283	283
Number of states	48	48
Adjusted R-squared	0.75	0.79

Significance codes: p<0.001 '***' p<0.01 '**' p<0.05 '*'
Standard errors in parentheses

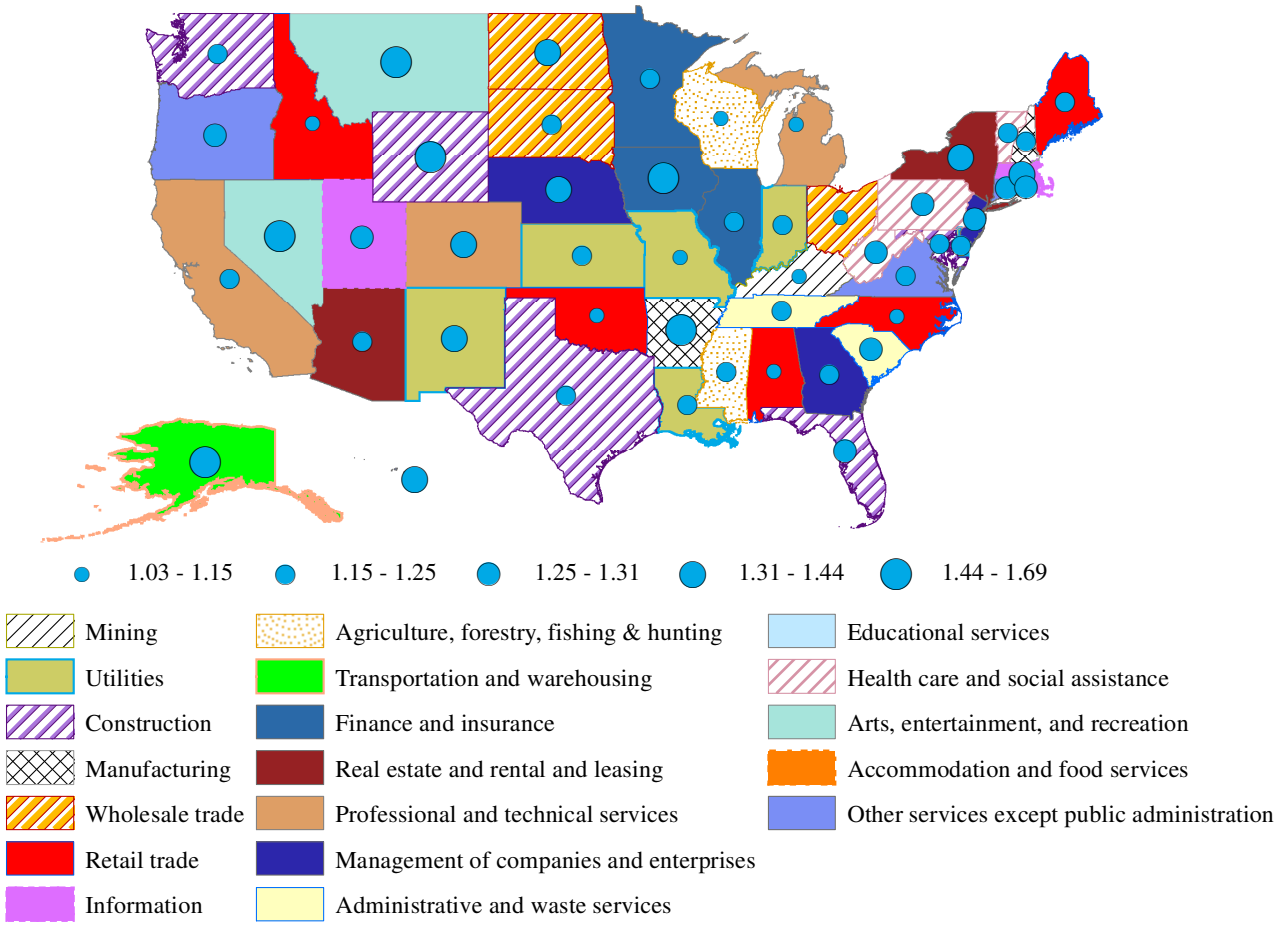

Figure A.1: Third strongest industry in the American states (The circle markers indicate respective LQ value)

VITA

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Education

PhD in Political Science
American Politics major, Comparative Politics minor
Economic Development Policy and Economic Growth in the American States
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Master of Environmental Design (MEDes)
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Interests

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Experience

Khulna University, Urban and Rural Planning (URP) Discipline
- Assistant Professor, Dec 2011- (on study leave)
- Lecturer, Sep 2008-Dec 2011
- Research Officer, Feb 2007-Sep 2007

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Teaching

University of Mississippi, Department of Political Science
- Introduction to American Politics, Judicial Politics (TA, 2017-2018)
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- Master's: Planning Practice & Ethics, Planning Workshop (2015-2017)
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Publications

Islam, M.S. and Quinn, M. 2021. A composite graph theoretic approach to modeling landscape connectivity in western Canada. *Journal of Environmental Informatics Letters,* In press. http://doi .org/10.3808/jeil.202100057

Baumann, Z.D., Winburn, J., Russo, S.J., and Islam, M.S. 2020. What Are Friends for? The Effect of Geographic Proximity on Primary Turnout in Gubernatorial Elections. *Political Research Quarterly*, February: 1-15. https://doi.org/10.1177/1065912920906202

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Islam, M.S. and Akhter, S. 2012. Measuring physical accessibility to health facilities – a case study on Khulna City. *World Health and Population*, 3: 33-41. https://doi.org/10.12927/whp.2011.22195

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Working Papers

"What political factors cause urbanization in American cities? A study on representation of cities in Congress"

"Ideological extremism? The determinant of legislative influence in a polarized Congress"

"How does party platform on foreign policy affect American voting behavior?"

"How does globalization condition government ideology on trade policy?"

"Political engagement and susceptibility of employment to presidential change in America"

Conference/Seminars

Presenter at Disaster Resilience Mini Conference. Jan 19, 2018, Flagship Constellation, University of Mississippi, Oxford, MS, USA. Title: *Disaster risk index: A GIS based approach to take account of socio-political factors*

Session Coordinator at Expert Symposium for Technical Design of Community Adapted Affordable Housing [Post disaster mitigation planning in Aila/Sidr affected communities], Practical Action Bangladesh, Dhaka, 2011

Key Note Speaker at the Regional Level Seminar on Urbanization, Traffic Jam and Environment in Khulna, Bangladesh Poribesh Andolon (BAPA) and Bangladesh Environment Network, Khulna, 2010

Editorial Service & Reviews

Associate editor: Plan Plus, 2016-2017
Manuscript/s reviewed for: Plan Plus, International Journal of Disaster Risk Reduction, Evaluation and Program Planning, Journal of Urban Management

University Service [Khulna University]

Bachelor's Curriculum Development Committee: 2010-2011, 2015-2017
Planning and Development Research Center: Coordinator, 2009-2011, 2016-2017
Khulna University GIS Lab: Course Coordinator, 2009-2011, 2015-2017
BURP Thesis/Project Coordinator, 2010, 2015
URP Discipline Undergraduate Advisor, 2008-2011, 2015-2016

Short Courses Designed and Coordinated

Professional Training on SPSS and Social Research; Planning & Development Research Center (PDRC), Khulna University, Khulna, 2011 [5 days]

Short Training on Geographic Information Systems, Planning & Development Research Center (PDRC), Khulna University, Khulna, 2010 [5 days]

Professional Training on Disaster Management, Khulna University and Comprehensive Disaster Management Programme (CDMP), UNDP, 2009 [5 days]

Advanced Technical Skills

Data and Statistical Applications: Stata, R
Spatial Analysis: ArcGIS+Python, Erdas Imagine, PCI Geomatica
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Design & Graphics: AutoCAD, SketchUp, Video Editor

Project Experience

As PI/Co-PI

The World Bank-Higher Education Quality Enhancement Project (HEQEP), 2017

- Project Designer (with Zakir Hossain and Prof. Ashraful Alam) and Member, *Discipline based learning enhancement for graduate planning students to meet 21st century challenges* (A supplementary project in URP Discipline, Khulna University), $125,000

World Vision Bangladesh: Child Safety net Project, 2015

- Principal Investigator, *Evaluation of Child Friendly Spaces,* $6,000

Practical Action Bangladesh: Infrastructure Services, 2012

- Lead Consultant, *Situation Analysis for waste management in a secondary town of Bangladesh – A case study of Satkhira,* $7,000

Practical Action Bangladesh: Infrastructure Services, 2012

- Lead Consultant, *Institutional governance and technology mapping for water supply, sanitation and hygiene services,* $11,000

The World Bank-Higher Education Quality Enhancement Project (HEQEP), 2010

- Project Designer (with Prof. Zakir Hossain and Prof. Rezaul Karim) and Member Secretary of Procurement, *Discipline based learning enhancement project in URP Discipline, Khulna University,* $465,000

As Analyst

University of Mississippi, Social Science Research Laboratory, 2018-

- Graduate Assistant, *Baseline Assessment of Properties for Blight Elimination Program*, a project with Mississippi Home Corporation

Deakin University, Faculty of Business & Law, 2013

- GIS Technologist, *Developing global spatial database and computing ruggedness for irrigation modeling*

Mount Royal University, Institute of Environmental Sustainability, 2013

- Research Analyst, *Landscape connectivity in and around Glenbow Ranch Provincial Park,* a project with Alberta Parks

Practical Action Bangladesh, Infrastructure Services Program, 2008

- Project Officer, *Site analysis for growth facilities center in rural market places in Bangladesh*

Khulna University, Urban and Rural Planning Discipline, 2007

- Research Officer (M&E), *Disaster risk assessment and development of Early Warning Dissemination System for the Southern Coastal region of Bangladesh*, a partnership project with UNDP Bangladesh

Scholarships, Awards, and Fellowships

- Summer Stipend, Department of Political Science, University of Mississippi, 2021
- Social Science Research Lab Summer Funding, University of Mississippi, 2018, 2019, 2020
- Bhagat Scholarship, University of Mississippi, 2017
- Short Course Initiative of VLIR-UOS-Belgium, 2015
- Faculty of Environmental Design Research Grant, University of Calgary, 2014
- Faculty of Environmental Design Graduate Award, University of Calgary, 2013
- Alberta Innovates Technology Futures (AITF) Masters Scholarship, 2012
- Bangladesh Water Partnership Fellowship, 2011
- Asian Disaster Preparedness Centre (ADPC) Fellowship for Earthquake Study, 2009
- UNDP Fellowship for Training of Trainers on Disaster Management, 2009
- Khulna University Planners Alumni Research Award, Dhaka, 2007
- Yearly Merit Based Scholarship, 1st position, Khulna University, 2005, 2006