Decentralizing economic policy: The impact of Regional Development Agencies on the regional economy

Moonen, Daan

Decentralizing economic policy: The impact of Regional Development Agencies on the regional economy

Thesis submitted for the master's programme of Economics & Governance

Author: D.W. Moonen (s3379477)

Supervisor: Dr. M. van Lent

Department of Governance and Global Affairs

Leiden University

The Netherlands

01-06-2022

Abstract

With economic globalization comes a growing emphasis on the development of economic policy on the regional level. A popular policy option is to establish a regional development agency. This study researches the effects of these agencies on the regional economy and surrounding regions through panel data of Dutch provinces from 1970 through 2016. Results show mostly not-significant effects. However, there appear to be small positive effects on the total value added within a region. Furthermore, this study finds no evidence for potential negative competition effects. The establishment of RDA's has not prevented some regions from experiencing significantly lower growth compared to other regions.

Submitted on 01-06-2022

TABLE OF CONTENTS

Introduction

Establishing of ROM's or RDA's

In 2014, the Technopolis Group conducted an extensive evaluation on the spatial economic policy of the Netherlands. They concluded that there have been two major shifts in economic policy regarding intranational differences. Up until 2005, policy was aimed at stimulating the regions that were considered to be lagging relative to the other regions. The goal was to flatten out the economic differences between provinces within the Netherlands. This was to be done through the establishment of organizations, the provision of subsidies and through direct investment in physical infrastructure. This would, in turn, lead to higher economic growth. In the literature the emphasis on regional economic development is often referred to as *Local Economic Development*, or *LED* (Malizia et al., 2020). However, this view on regional economic policy shifted after 2005, towards a policy that would place more emphasis on promoting sectors and regions that were performing relatively well or were experiencing rapid growth (Rijksoverheid, 2010).

A common denominator in both views on regional economic policy was also one of the more unique policy instruments: the establishment of so-called Regional Development Agencies or RDA's (Technopolis, 2014). Four of these organizations were founded between 1975 and 1983 for the Dutch provinces that were classified as lagging. As of 2021, with the establishment of an RDA for the province of North-Holland, the RDA's provide a network that cover all Dutch provinces. The Dutch RDA's are organisationally very similar; the main goal is to invest or participate in business ventures within the region. Funding comes from several levels of government: local, provincial, and national. RDA's also work to develop business centres, promote international trade, and encourage cooperation between local business, universities, and other organizations. The goal of an RDA is, in line with the LED-policies mentioned earlier, to increase the economic development within the regional borders. In this study, the establishment of RDA's and the two shifts in Dutch regional policy are linked to larger shifts in policy that are related to increasing economic globalization.

Paradigm shifts in Dutch economic policy

Three causes were found to explain the 'paradigm shift', where the policy focus shifted from promoting equality to helping fast-growing sectors. Firstly, the differences between Dutch regions were too minimal to warrant a policy focused on decreasing those differences. Secondly, the new policy was to achieve just as much economic growth while being less expensive, and consequently the new policy was deemed to be more efficient. Thirdly, the state realized that regional peaks were a strength that could be exploited. Both paradigm shifts encouraged the state to delegate more economic power to subnational regions. First to the 'lagging' regions, and then to the regions that were considered to be doing well. Hence the fact that Regional Development Agencies were established during both paradigms. However, little is known on the actual effectiveness of this policy.

There are very few recent papers on regional development agencies. Existing literature on regional development agencies focus mostly on relatively poor regions and countries, such the Balkan countries (Jovanic, 2019), Turkey & Rumania (Toktas et al., 2018) and extensively on South-African regional development agencies (Nel, 2019; Rogerson, 2018; Lawrence & Rogerson, 2019). The only recent study on RDA's in western countries focusses on the demise of RDA's in England (Pike et al., 2018). Most studies are individual case-studies, with comparative studies being done few and far between (Halkier, 1997). The comparative case studies that have been done are of a qualitative nature, and do not attempt to measure actual economic effects of RDA's. This is where this study hopes to add to our understanding of bottom-up, regional level economic policy.

At the same time, the decentralisation of economic policy is a continuing process. For the Netherlands in particular, it seems more and more regional organisations and regional partnerships, such as triple-helix models and Economic Boards, are popping up (Technopolis, 2014). This due to increased regionalisation. This study relates this to two factors: increased pressure on local governments and to develop entrepreneurial policy, and growing emphasis on geographically dense economic clusters. Whatever the driving force behind this process may be, it is vital for the development of regional and, consequently, national economies to know whether the rationale for decentralized economic policy is based on facts.

The goal of this study is to help answer one of the main questions of Local Economic Development; how effective is decentralized economic policy in stimulating the economy? In this study, we operationalize decentralized economic policy through measuring the effects of Regional Development agencies, which represent a typical form of local economic policy. Thus, we operationalize the question of the effectiveness of decentralized economic policy in the following research question: *how effective is the regional development agency in stimulating the regional economy?*

For the main research question, two statistical analysis methods are used: the regression discontinuity and the difference-in-difference method. Through analysis of panel data from all twelve Dutch Provinces over the period of 1970 through 2016, the study finds few significant effects. Only when the untreated regions are excluded from the analysis, do we find significant positive effects of RDA's on the regional economy.

However, two more research questions are formulated based on the review of the existing literature: *have Dutch regions economically converged or diverged from 1970 to 2016? And does the establishment of a regional development agency in one region, have negative effects on surrounding regions?* In answering these two questions there is the opportunity to place the results from the main question in a more nuanced context. For the first question, this study uses the methodology proposed by Philips and Sul (2009) and included in the Stata package designed by Du (2017). It provides a robust measurement of convergence between regions and grouped regions. Overall, the study finds that Dutch regions have diverged. However, this is effect is caused by five regions; the remaining provinces have converged over time. For the second question the Regression discontinuity is used to measure economic development of the province of Utrecht before and after the establishment of an RDA in a neighbouring region. The outcomes show no significant effect.

1) *How effective is the regional development agency in stimulating the regional economy?*
2) *Have Dutch regions economically converged or diverged from 1970 to 2016?*
3) *Does the establishment of a regional development agency in one region, have negative effects on surrounding regions?*

Theoretical Framework

As mentioned earlier, recent studies on RDA's and local economic policy tend to focus on relatively poor regions. Most of our understanding on RDA's in (western) Europe comes from the author Henrik Halkier, who has written multiple articles and books on this subject (e.g., Halkier & Danson, 1997; Halkier, 2011; Halkier 2012; Halkier & James, 2016). This paper will rely heavily on the theoretical frameworks that he has developed. First, we will define RDA's, their activities, and their role within changing governance structures. Secondly, we will tie the existing knowledge on RDA's to more general trends such as globalisation and regionalisation. Thirdly, we will analyse existing literature on why regional policy would (or would not) be effective in increasing economic performance of a region.

Defining the Regional Development Agency

The introduction has already mentioned some characteristics of regional development agencies in the Netherlands. To start with a theoretical definition, Halkier (2011) defines regional development agencies as: *"a publicly financed institution outside the mainstream of central and local government administration designed to promote indigenous economic development through the integrated use of predominantly soft policy instruments"* (P.2). This definition covers three central components of the RDA, namely their funding, role in the governance structures and their policy instruments.

Halkier (2011) has done extensive analysis of sources of funding for regional development agencies across Europe (N=178). Given the regional focus of a regional development agency, one would expect funding to come from the same regional level as well. While this is true for many agencies, more than half of them receive funding from either local, central, or multi-level government (see appendix: table 1). The Dutch RDA's (see also, appendix table 1) all seem to fall in the multi-level category; this is in line with the finding that Dutch provinces have a comparatively low amount of autonomy (Halkier, 2012). The first wave of RDA's (1974-1983) was funded primarily by regional and national government (Hoogstraten, 1983). Newer RDA's are also being funded by local governments (cities within the corresponding region) on top of the regional and national funding. Important to note is that some part of the funding of RDA's is often intended as being start-up capital. As will be explained later, RDA's aim to be self-reliant in the sense that that invested fund should translate into a return in profits down the line.

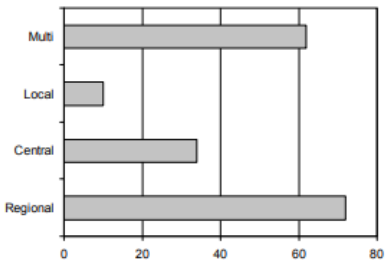


Figure 2. Sponsors of RDAs. Number of organisations (N = 178). *Source:* RDA survey 2007 database.

Figure 1, Source: Halkier (2011)

The source of funding of RDA's directly ties in their role in the governance structure of a country. RDA's are identified by the Mountford (2009) to enact several key roles for regional development, including building markets; providing leadership, governance, coordination; and to ensure implementation. Halkier (2012) finds that the vast majority of RDA's have been given considerable powers for strategic initiatives and implementation and that they operate with a large amount of autonomy 'at arm's length' of their sponsoring government departments. The same is true for Dutch RDA's; they seem to operate with autonomy, whilst also having to report to government stakeholders on a yearly basis. Interestingly, in the Netherlands, while also being true for many other RDA's, an agency works in an environment where other public agencies also pursue regional development goals (Halkier, 2011; University of the Free State, 2019). This puts the RDA's in an interesting context, where they both compete and cooperate with other regional and national public bodies that share the goal of regional development. This is one of the reasons why regional economic policy might prove to be ineffective on achieving its goal of economic development; but this shall be discussed further in the last chapter of the theoretical framework.

Mountford, who has studied RDA's for the OECD in 2009, has found that regional development agencies, in general, have five unique goals and policy instruments at their disposal. I have paraphrased those goals as follows:

- Establish (intra)regional coalitions, encourage coordination and leadership, and provide assistance in monitoring, advocacy, and planning (Strategic role).
- Provide property development, lend and/or invest in regional companies and manage grants (Investment role).
- Promote local R&D, innovation, invest in the local labour market to increase skill development and create and maintain employment through promotion of entrepreneurship and small-to-medium sized companies. (Labour and innovation)
- Enable and promote (international) investment and undertake project management (Promotional role)
- Play a leading role in sectoral and cluster development and capacity-building undertakings (Capacity-building role).

Halkier's findings (2011;2012) are in line with these proposed strategies of the OECD, finding that over 90% of all RDA's in Europe state improving the competitiveness of a region as a main goal. A high amount of RDA's state that they want to bring about a qualitative improvement in the economic activity of a region. Furthermore, he also finds that policy instruments bringing about change are not primarily financial but employ a much wider range of tailor-made informational and organizational resources. The next chapter will discuss how globalisation is related to these goals and to the establishment of RDA's.

Globalisation and regionalisation

Globalisation is widely discussed and written about subject, with many unique and wide-ranging aspects. This research will focus primarily on the economic aspects of globalisation, which is defined by Thompson (2000) as a process of increased interdependency and increased integration due to dynamics in international trade of goods and services, and the flows of capital and technology. A unique parallel process to economic globalisation is regionalisation. As the name suggests; regionalisation describes a process in which regions become more economically autonomous and important. The council of Europe describes regionalisation as:

".. the process of transferring power from the central government to the regions, for a better application of the subsidiarity principle, within the framework of national or federal solidarity. It includes the establishment, enlargement or empowerment of authorities and the transfer of competences and responsibilities to the regions" (2009, p1).

This definition encompasses two important aspects. Firstly, it mentions a transfer of power from central governments to the regions. Secondly, it implies, through the principle of subsidiarity, that the responsibilities to be transferred are more suitable for regional governments than national governments.

Although globalisation and regionalisation seem mutually exclusive, they are not contradictory processes (Kim et al., 2002; Isaksen, 1997). Both processes have a commonality in the sense that they lead to an 'erosion' of the nation-state as a sovereign and autonomous centre of power. The growth of the EU, for example, is often seen as the example of the delegation of (economic) autonomy from the nation-state towards regional government (Evan & Hardin, 1997). However, as the cases in this study show, regionalisation is not restricted to the development of supranational regions. A 'region' is not a fixed term, so regionalisation can imply transfer of power to the European Union but can also be seen as a shift of power from the nation-state to local and or regional governments such as municipalities or provincial governments. The latter is the phenomenon which this study is interested in and what is being referred to when the term *regional* is used.

Considering that globalization, through regionalisation, can lead to more power being delegated to local and regional governments, it is not unthinkable that the establishment of RDA's within the Netherlands originate from this process. In this study, two specific interrelated consequences of globalization seem to be related to the development of local economic policy in the Netherlands:

- **Stress to develop entrepreneurial policy for local governments.** The anchors for this policy shift include the Barca Report to the European Commission (Barca et al., 2012) and the two OECD reports: How Regions Grow and Regions Matter (OECD, 2009a; 2009b). The Barca Report argues for place-based policies, as the most effective way to tackle persistent poverty and the underutilisation of resources, while the OECD reports argues that all regions and places have growth potential and require uniquely targeted interventions to mobilise local assets and draw on local synergies. Seeing how this is a continuing factor, it could explain the ad-hoc establishment that is typical for Dutch RDA's (Bond, 2018; Technopolis, 2014). The same policy shift is also studied by Halkier (1997), who describes it as a shift from top-down policy to bottom-up policy. While many agencies were initially set up in response to tackle problems of underdevelopment, increasingly they are being set up to promote and develop local cities and regions (Mountford, 2009; Halkier, 2012).
- **Growing emphasis on the development op (geographically dense) clusters**. This concept has mainly been popularized by Porter (1998, amongst other publications) and is also in line with the second paradigm change in Dutch economic policy, where the government decided to invest in sectors and regions that were performing exceptionally well (Rijksoverheid, 2010). Porter is responsible for popularizing the geographical cluster-based approach to economic policy. In his much-cited 1998 work *Clusters and the new economic competition*, Porter defines a cluster as geographic concentrations of interconnected companies and institutions within a certain field. A cluster encompasses an array of linked industries important to competition (p.78). He argues that clusters are the essence of a competitive region, and that policy makers would do well to promote clustering. This idea has been very influential among policy makers (McDonald et al., 2007). RDA's in the Netherlands often

focus on specific sectors to promote within their region, which is very much in line with the growing popularity of Porter's idea of clusters (Technopolis, 2014; Halkier, 2012).

Why regional policy would (not) work

One of the more central and non-disputable rules in economic geography is the fact that economic activity is not evenly spread out across space. This distribution is uneven at several geographical levels, and surely is relevant when analysing the regional levels within the borders of a certain country (Garretsen et al., 2013). The distribution is quite dynamic and, interestingly, evidence on how this dynamic has been shifting within countries points to both convergence and divergence between local regions. Some evidence seems to suggest that poorer and richer regions within countries have been drifting apart, with wealthier regions taking up a larger a larger slice of the pie (World Bank, 2008; Gardiner at al., 2004). There also is evidence that suggests the opposite; as the economy and industry within a country develop and mature, productivity gaps and the concentration of economic growth decrease rather than increase (Dijkstra, 2013). Unclear is how the delegation of economic authority to regions affects this distribution. The decentralization of economic policy started as a method to stimulate convergence between regions within the country, but is also used as a way to help the fast-growing regions grow even faster (Hoogstraten, 1983; Technopolis, 2014).

The question whether committing to decentralizing economic policy, i.e., establishing local economic policy, helps to decrease or increase economic differences within a country, is one of the core research questions of Local Economic Development (Bond, 2018). This also leads to another question; how effective is local economic policy in stimulating the local economy? With evidence pointing in both the direction of a general convergence and a general divergence on the regional level, it could well be the case that the stress on regions to develop regional economic policy has no significant effect on the economic development within that region. However, in the Dutch case, regions that were early adopters of RDA's were the ones that were lagging in economic development. If RDA's are successful in their goals, one would expect to see a convergence of regional economies in the Netherlands in the timeframe between establishment of RDA's in lagging regions, and the establishment of RDA's in frontrunning regions. To test this, the following null hypothesis is formulated:

Research question 1*: How has the distribution of economic activity between regions changed under the influence of increased regionalisation?*

Existing literature has not yet provided a definitive answer on the question whether regional economic policy leads to increased economic development. There is even some evidence that argues that the opposite is true. Lengyel (2009) argues that, as globalization changes the economy, inter-regional competition is increased to the detriment of the regional economy. As companies are freer to move to any region that they see as attractive, regional governments will be forced to compete with other regions to convince these companies to move to their region *or* to not move to a different region (the same reasoning can be applied for attracting people to a region as well). There is, however, scarcity when it comes to investments made in the new market segments demanding special expertise and talented experts (Malecki 2002, p. 930). Meaning that regions that successfully attract talented workers and investments, welfare will improve, attracting more talented workers and more investments & companies as a result. As mobility of workers and companies is increased due to globalization, but remains limited, it is likely that talented employees and/or companies originate from regions within the same country. This is in line with the fact that most RDA's state that one of their main objectives is to increase the competitiveness of their respective region

(Halkier, 2012). In short, developing and investing in regional economic policy could be interesting from a regional point of view, but from a national perspective the effects could also be neutral or negative, as increased growth in one region is simply 'taken' from neighbouring regions. Possible other downsides of the establishment of regional developments agencies could be: "*a lack of clarity over the respected roles and responsibilities of the development agency and the municipal actors, a lack of executive power, disagreement among members, interregional rivalry and the lack of a regional focus".* (University of the Free State, 2019, P.18).

The same research argues that regional development agencies take up a number of tasks that could also be done by local authorities. RDA's, however, are more independent and could enjoy a larger amount of support from a larger share of relevant stakeholders; thus, the subsidiarity principle implies that the region would be more effective in developing and implementing economic policy. An RDA is also considered to be more neutral than local authorities and because of this, is also able to operate with more flexibility in a legal and political sense (University of the Free State, 2019). An RDA operates in a very multi-level set-up which require a large amount of cooperation as is also evident from Porter's theory of clusters (1998). Globalization requires effective policy networks to be set-up in such a way that they also include knowledge institutions, local companies, and other relevant actors. Traditional local government, however, is mostly engaged in public sphere. In this sense, an RDA would be more effective in performing certain regional economic activities compared to the more traditional local authorities. This increased effectiveness in turn leads to increased economic development. To test this, the following hypothesis is formulated:

Research question 2: *Does decentralized economic policy, through the establishment of a regional development agency, have a positive impact on regional development?*

Empirical evidence on the effects of globalization and regional competition (or lack thereof) in the Netherlands is quite limited. The evidence that does exist, could point in both directions. A study by the Spatial Planning Agency in 2007 on movements of people and companies within the Netherlands finds that most companies that move, do so within the borders of the same municipality (75%) or within the same region (94%). The remaining 6% moves outside regional borders, which is quite a limited number and points in the direction of limited effect of increased interregional competition. The same studies finds that the companies that *do* move, often bring their jobs with them, although this does not necessarily mean that their employees move to a different province as well. Moving companies also grow significantly faster compared to their non-moving equivalents. This could mean that the more competitive companies, which are also more attractive for regions, are the ones that are prepared to move across regional borders. To test the potential negative competition effect, the following hypothesis is formulated:

Research question 3*: Does the establishment of a regional development agency in a region have negative impacts on the economy of surrounding regions?*

Methodology

This study has established that there is a lack of quantitative knowledge on the effects and effectiveness of local economic policy. Even though globalization acts as a driving force in decentralization of economic policy; little is known on the effects of this. This study aims to exploit the fact that, over the course of the last 40 years, every region in The Netherlands has established a regional development agency at a different point in time. If local economic policy increases economic performance of a region, we should expect all regions to experience a significant change in trend in variables that indicate economic development. This is the main empirical question of this study. However, two additional questions are added based on existing literature. Thus, this study aims to answer the following three research questions:

Research question 1: How has the distribution of economic activity between regions changed under the influence of increased regionalisation?

Research question 2: Does decentralized economic policy, through the establishment of a regional development agency, have a positive impact on regional development?

Research question 3: Does the establishment of a regional development agency in a region have negative impacts on the economy of surrounding regions?

Based on these three research questions, three null hypotheses are formulated. As clear in the literature review, there is often evidence that points in opposite directions; and consequently, the null hypotheses are formulated so that evidence can point to both negative and positive effects of the independent variables.

Null Hypothesis 1: *There have been no significant changes in the distribution of economic activity between regions in the Netherlands during the 1970-2016 time period.*

Null Hypothesis 2: *The establishment of a regional development agency has no significant effect on the economic development of the region in which it is located.*

Null Hypothesis 3: *The establishment of a regional development agency has no effect on the economy of surrounding regions*

Data

This study uses data that is sourced from the Central Bureau for Statistics (CBS). Seeing as the oldest RDA's were established in the 19070s; data for those time periods is scarce and not readily available. Especially when considering that data must be measured on the regional level. The age and the level of measurement are the two main limiting factors for the availability of datapoints. The CBS, however, has measured several economic indicators separately for all twelve Dutch Provinces since the 1970's. At the start of the measurement, the number of variables that were measured on this provincial level is rather limited. The number of variables measured increases with more recent datasets, but for the sake of comparability these cannot be included in this study. The study has combined a total of 5 different datasets of the CBS. Important to note is that the level of measurement is on the provincial level, and not on the level of RDA's.

As of 2022 (see figure 2) the entirety of the Netherlands is covered by regional development agencies, with the most recent agency being established in 2021 in the province of North-Holland. In total the Netherlands has twelve different provinces (N=12), all of these 12 cases are included in the

dataset of this study. The number of Regional Development Agencies, however, is lower since the three northernmost provinces share the same organisation, as well as the provinces of Gelderland and Overijssel. This makes little difference for the study, as the provinces that share an RDA still receive the 'treatment'. The map below shows a graphic representation of the network of Regional Development Agencies and their corresponding year of establishment. However, it must be noted that this study differs from the image below on two accounts. This is based on the historical analysis by van Hoogstraten (1983). Firstly, the RDA of Oost-NL exists in its current form since 2003, when the RDA's of Overijssel (est. in 1975) and Gelderland (est. in 1976) merged. Secondly, the RDA of the province of Limburg (LIOF), was founded in 1974, but had very limited capabilities until 1975.

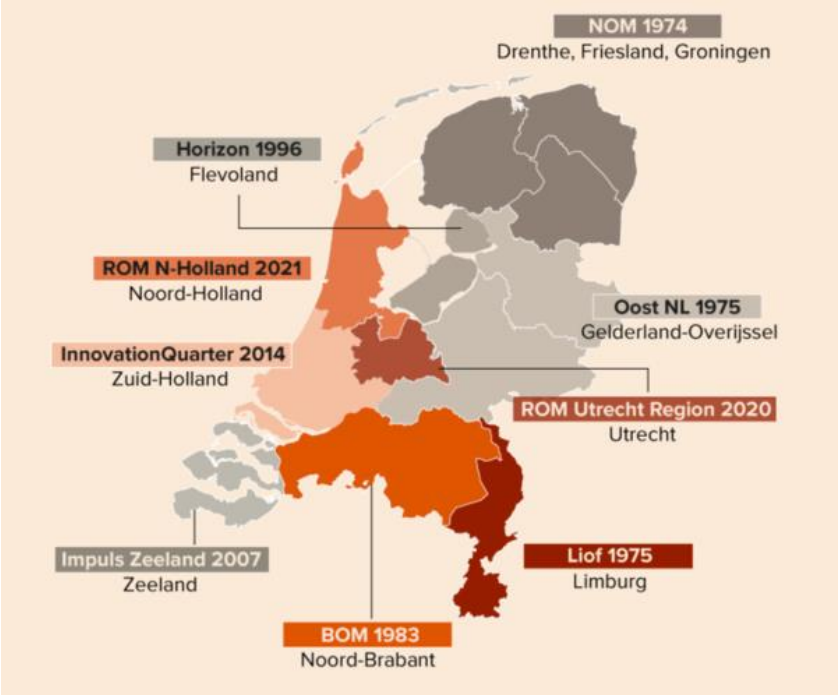


Figure 2, Source: Altfinance.com

Measurement of GDP over time

At 4 points in time the CBS made slight changes in the way GDP and Employment Volume were measured**.** This means that for the years 1987-1993, 1995-2001 and 2010-2011 there are two different datapoints for both the Value Added & Employment volume of each region. The changes made are small but could be significant when using an RD-regression. For this reason, the study uses a variable that averages the differences between the observations in the new and those in the old method. For the years 1971 and 1972 no data is available, for the sake of simplicity, development is assumed to be linear from 1970 through 1973.

Operationalisation of the independent variable "decentralized policy"

The main independent variable of interest in this study is the decentralization of economic policy. Naturally, economic policy can be designed in numerous ways; and economic development is influenced by numerous variables. This poses a challenge for any research that wants to infer causality. The establishment of RDA's in the Netherlands provide an opportunity to tackle this problem for two reasons. Firstly, Regional Development Agencies have a relatively broad set of instruments that can be used to stimulate the regional economy. This means that, as opposed to when they would have a single instrument, they execute regional economic policy in various ways

providing us with an opportunity to measure the effects of regional economic policy as a whole, instead of just one aspect of it. Secondly, since RDA's were established in different years, it provides us with a more solid base on which causality can be inferred. Furthermore, the Technopolis study (2014), found that the RDA's were established in an ad-hoc manner; meaning that the study is unlikely to suffer from anticipation effects. Historical documents are in line with this conclusion: van Hoogstraten (1983) states the reasons for establishing the RDA's in 1974-1976 were driven by the fear that the economic trend for related regions was going downhill, and that this trend would not change without an RDA. i.e., they expected the trend at the time to continue as it was, not to change.

Regarding generalizability, an issue could be presented when confronted with the facts that on some aspects, Dutch RDA's are different than RDA's elsewhere in Europe. If those differences lead significant difference in the effectiveness of an RDA, this study is only generalizable for RDA's that are equal on relevant aspects (See Halkier, 2011 & Appendix Table 1). However, there is still a rather large amount of uniformity when it comes to goals of RDA's across Europe. A second pro to generalizability of results across RDA's is that a large organization in terms of finance is not necessary to achieve those goals (Halkier, 1997). In other words: the amount of funding an RDA receives is of little importance to whether it will succeed in achieving its goals or not; however, it could determine the extent of its success.

Operationalisation of regional economic performance

Operationalization of trend changes in economic development can be measured in variety of ways. The most common and comprehensive measure is the GDP. Due to the lack of historical provincial data; only the regional amount value-added and the employment volume (total FTE's within a region) is available for all time periods and regions. Measuring economic performance will be done through these two measures, with the Value-Added being considered the most suitable measurement. From these two variables, the following outcome variables are generated (for variable names in Stata, see table 3 in the appendix):

1) Value-Added per region, corrected for inflation.
2) Volume of employment measured as total FTE's per region.
3) Growth of value-added for each region.
4) Growth of total FTE's per region
5) % Share of value-added of the total national GDP per region.

As mentioned, the value-added is considered the most reliable method of measuring economic development. As another method of reducing the effect of exogenous market shocks; the regional share of total national GDP is introduced. If an RDA is established in a period of economic downturn, it could well be that the total value-added of a region remains stable or drops, but the relative size of the regional economy within the Netherlands could still be increasing. This requires the assumption that regions in the Netherlands are affected equally in periods of economic downturn. This appears to be the case (see figure 3 and appendix graph 4).

Methods of analysis

First, we found that there is uncertainty on the 'converging' effects of globalization, and on the role of Local Economic Policy in this. This assumption is that, should local economic policy lead to convergence of regions within a country, this converging force would be highest when lagging regions have established an RDA, but frontrunning regions have *not* yet done so. Luckily, this is the case for the years 1983 through 2014. Typically, one would compare the means of the laggers with the frontrunners in both periods. A significant difference could indicate a converging effect of

globalization. This paper, however, uses the Stata algorithms Designed by K. Du in 2017, designed to measure convergence of GDP of countries over time; in this study it is used to measure the economic convergence (or divergence) of provinces. The methodology incorporated in this algorithm is designed based off the propositions by Philips and Sul (2009); they argue that traditional measurements of convergence suffer from some large flaws. Ku's analysis through Stata covers these pitfalls in two ways. Firstly, it includes measurements that allow for heterogenous behaviour between agents, although this factor does not necessarily apply to this study. Secondly, the algorithm does not require assumptions regarding *"trend stationarity or stochastic nonstationarity"* (P.2), and through this, offers a more robust and thorough analysis of economic development of cases. Furthermore, this method allows for the measurement of converging clubs. For this study, this means grouping provinces that have been converging within the Netherlands. Conventional methods can only do this based off pre-existing information and only measure convergence of all observations grouped together. While this is useful information, it is interesting to check for convergence within and between all provinces. Thus, this method measures overall convergence, but also measures convergence between **and** within groups of similarly growing provinces. This is done by grouping provinces that show similar economic development, and then comparing these groups. Comparing overall convergence and convergence within and between similar groups of provinces could provide for a much more nuanced picture of convergence (or divergence) of Dutch regions. The outcome of this analysis tells us not only if there is significant convergence or divergence, but also the speed at which this is happening, with a higher coefficient meaning faster convergence.

Secondly, the method used for the main research question is that of a regression discontinuity, where the treatment is stated as being the establishment of a Regional Development Agency. The trends of several economic variables will be measured before and the year in which and RDA is founded. If there is change in this trend can then be related to the fact that the establishment of this agency is the commonality between measured regions. The variation in the years of establishment of RDA's in Dutch regions decreases the chance that any found changes in trend are due to other exogenous changes that influence economic development in a certain year, i.e., provides more robust results than if all RDA's would be established in the same year. If all agencies were to be established in the same year; there is a much higher chance that trend changes occur due to e.g., market shocks or business cycles. For the regression discontinuity design, this paper will work with the most recent rdrobust package for Stata as designed by Calonico et al. (2017). This package provides a more robust estimation of the treatment effect compared to the conventional RD-method. The *rdrobust* command constructs local-polynomial point estimators and robust confidence intervals at the cut-off. The command *rdbwselect* selects the optimal bandwidth for the RD analysis (Calonico et al., 2017).

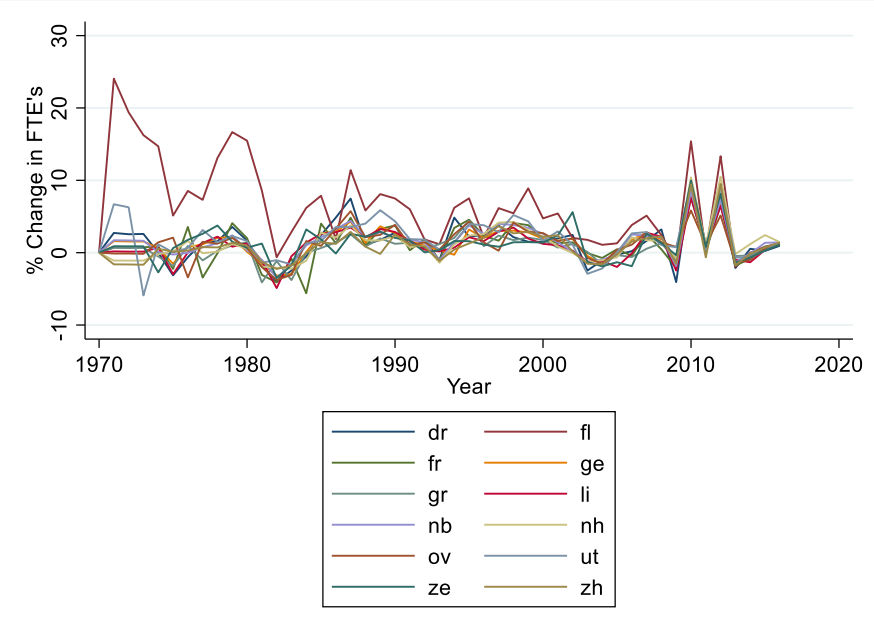


Figure 3: Value-Added per region 1970-2016

Besides the RD design, a second statistical method is used to measure the effect that establishing an RDA has on the regional economy. The graph above depicts the % change in total FTE's for all regions for the years 1970 through 2016 (see also: appendix graph 4). It is clear that region follow a mostly similar trend and react to market shocks in a very similar fashion. The clear exception being Flevoland (varname: *fl*) from 1970-1980; this is due to the fact that parts of this province simply did not exist during this period. The similarity in trends provide an argument to use a difference-in-difference method. This compares trends over time from untreated regions to trends of regions that were treated. If the establishment of an RDA has an effect on the regional economy; we should see increased economic development in treated regions compared to non-treated regions. Similar to the RD-design, the DID-analysis is done both with and without the untreated regions.

Thirdly, in the literature there is some doubt on the effectiveness of Regional Development Agencies. This is attributed (in part) to the increased competition between regions that could result from establishment of RDA's or local economic policy in general. This means that an increase growth in one region due to the creation of an RDA is, at least in part, growth that otherwise would have happened in surrounding regions. We test this through measuring whether or not the region of Utrecht experiences a drop in the Value-Added every time an RDA is established in a different region. Utrecht is believed to be the most optimal case for testing this idea due to its geographical location at the centre of the Netherland, and also since it was one of the latest regions to establish and RDA. Utrecht is also, together with the province of Noord-Holland, the province that has the highest share of jobs within the service sector (CBS, 2015). These are the companies that are, according to the data from the PBL (2007), most likely to relocate. For these reasons, the province of Utrecht is, based on the literature, the most likely to be potentially negatively affected by the establishment of RDA's in surrounding regions. If there is a significant drop in relevant economic variables for every year an RDA is established, this could be due to a negative competition effect.

Results

Convergence analysis

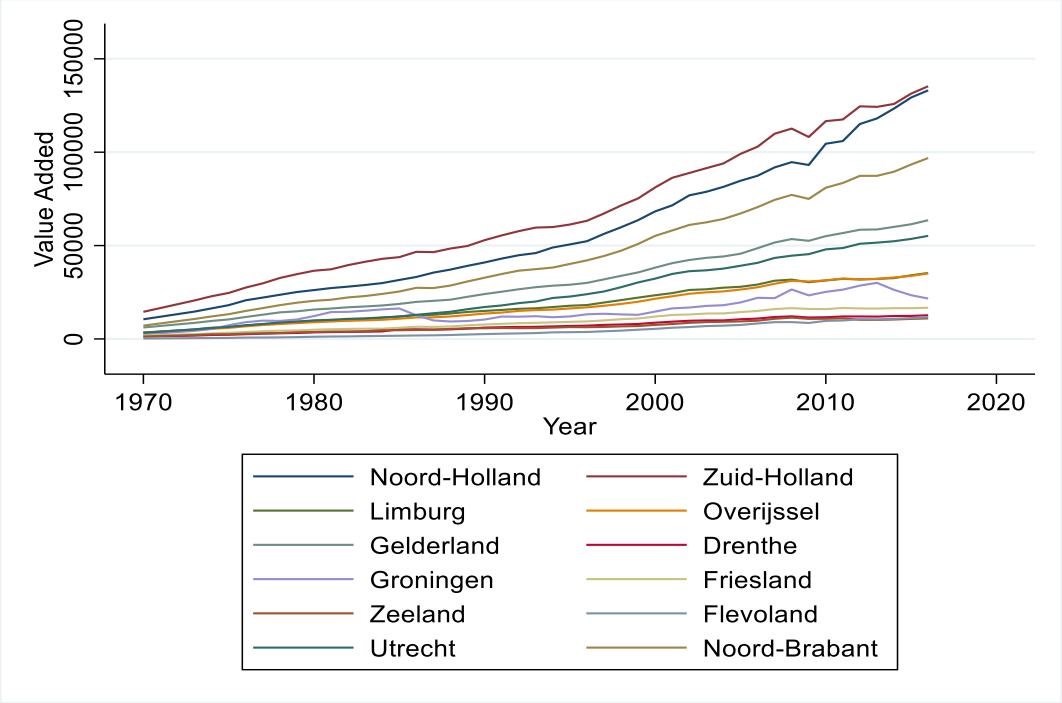


Figure 4: Value-Added per region 1970-2016

For the first research question a convergence analysis is used to measure convergence or divergence between all cases over time. We run the log t regression for the convergence test for all provinces. The output reports the coefficient of the convergence, standard error, and t statistic for log(t). A significant positive would represent convergence of total value-added all provinces within the Netherlands. A significant negative coefficient would mean that Dutch provinces are moving further away from each other in regard to economic output. Instead of using the standard variable of gdpa (corrected for inflation), the variable lngdp2 is constructed to account for the cyclical component of the economy using the following function: *pfilter lngdp, method(hp) trend(lngdp2) smooth(400).*

The table below shows the findings of the basic log(t) regression. The coefficient shows the overall diverging trend of value-added in Dutch regions. Because the value of the t statistic, -21.3678, is less than −1.65, the null hypothesis of convergence is rejected at the 5% level. Instead, we find that there is significant overall divergence in Value-Added per region within the Netherlands. The coefficient indicates the rate at which the overall differences in the variable *lngdp* between provinces are expected to increase.

Variable	Coefficient	Standard-Error	T-Statistic
Log(t)	-0.3234	0.0151	-21.3678***

We then use the *psecta* command to generate potential economic clubs/groups. This command implements the clustering algorithm to identify groups of regions that follow a similar path of economic development (Du, 2017). Given enough time, differences in economic output of regions within a club are expected to decrease, with a higher coefficient, again, defining the rate at which this process is happening. There are three converging clubs, and one non-converging group. The clubs and the corresponding coefficients and t-statistics are reported below. Note that these values reflect convergence of provinces (or lack thereof) within the club, not between clubs.

Club 1: Flevoland, Noord-Brabant, Noord-Holland, Zuid-Holland & Utrecht
Club 2: Limburg & Overijssel
Club 3: Friesland & Groningen
Non-Convergent group (4): Drenthe, Gelderland & Zeeland.

Log(t)	Club 1	Club 2	Club 3	Non-Conver. (4)
Coefficient	0.183	5.315	0.192	-0.692
T-Statistic	33.652***	2.966***	1.136	-83.792***

The following step is to use the *scheckmerge* command to analyse convergence between the clubs as represented in club table. The output reports the coefficient and the t-statistic for the log(t) regression. There is significant convergence between clubs 1 and 2 (T>1.65). Between clubs 2+3 and 3+4 there is significant divergence (T<-1.65).

Log(t)	Club 1+2	Club 2+3	Club 3+4
Coefficient	0.067	-0.511	-0.624
T-Statistic	7.362***	-13.935***	-24.788***

Lastly, the *imergeclub* command is used to merge the existing clubs into the final club classifications. As noted in table above, club 1 and 2 can be merged due to their significant between-club convergence. The remaining groupings remain unchanged. Again, we perform the convergence analysis to find the within-group convergence for the final clubs. The output reports the coefficient and the t-statistic for log(t). We find that, although overall regions within the Netherlands have diverged significantly, most regions have actually experienced economic convergence in output of value-added over the 1970-2016 time period. The overall divergence is caused by the strong divergence of mainly Drenthe, Gelderland, and Zeeland but also by Friesland and Groningen.

Club 1: Flevoland, Noord-Brabant, Noord-Holland, Zuid-Holland, Utrecht, Limburg & Overijssel
Club 2: Friesland & Groningen
Non-Convergent group (3): Drenthe, Gelderland & Zeeland.

Table of results 1

Log(t)	Club 1	Club 2	Club 3
Coefficient	0.067	0.192	-0.692
T-Statistic	7.362***	1.136	-83.792***

Table of results 2

Thus, the null hypothesis: *there have been no significant changes in the distribution of economic activity between regions in the Netherlands during the 1970-2016 time period*, can be rejected.

Regression Discontinuity design

The Regression-Discontinuity provides the basis of the results of this research. This design compares variables that are close to a certain cut-off point, where every observation after this cut-off receives the treatment, and the observations before do not. For this design to work, these observations are assumed to be similar regarding other variables that might affect the outcome. This study uses the sharp RD-design, rather than a fuzzy RD, as we can assume that all regions receive the 'treatment' after the year in which an RDA is established within this region.

For the *rdrobust* package to work; two modifications are done regarding the dataset. First, the regions of Utrecht and Noord-Holland (varname: *ut* and *nh*) are dropped from the dataset, as they have not received the treatment in the 1970-2016 time-period. However, due to the RD design, they would still be included in the 'non-treated' side of the observations; for this reason, they must be dropped. Secondly, a new variable is constructed that measures the distance from the year of treatment, as the *rdrobust* design requires one cut-off point in the running variable that is equal for all regions. For all regions, at point 0 of the variable *eventtime*, the treatment is started. All relevant variables are measured before and after treatment. The *rdrobust* command automatically measures the optimal statistical bandwidth as well as the optimal bias bandwidth (Calonico et al., 2017) that is wider than the optimal bandwidth. For extra robustness check, row 3 of the table of results (3) reports a narrower bandwidth as a control. The effective N left and right of the cut-off of each analysis is reported in the last column, with the upper value representing the first analysis from the left and so on.

Variable:	gdpa	gdpb	Labour	labchange	rel	Effective N
RDrobust	*8736 (*11524*)* Z=0.7580 P>Z 0.448 **Robust:** Z=1.0096 P>Z 0.313	*.0134* (2.031) Z=0.0066 P>Z 0.995 **Robust:** Z=0.0389 P>Z 0.969	*59.78* (127.44) Z=0.4691 P>Z 0.639 **Robust:** Z=0.7559 P>Z 0.450	*.9923* (.98274) Z=1.0097 P>Z 0.313 **Robust:** Z=1.1585 P>Z 0.247	*.8521* (1.6801) Z=0.5071 P>Z 0.612 **Robust:** Z=0.7297 P>Z 0.466	87 101 93 109 93 109 75 84 93 109
RD without untreated regions	*3484* (10070) Z=0.3459 P>Z 0.729 **Robust:** Z=0.5220 P>Z 0.602	*.05465* (2.081*)* Z=0.0263 P>Z 0.979 **Robust:** Z=0.0687 P>Z 0.945	*27.968* (126.4) Z=0.2213 P>Z 0.825 **Robust** Z=0.3851 P>Z 0.700	*1.003* (1.004) Z=0.9989 P>Z 0.318 **Robust:** Z=1.1456 P>Z 0.252	*.47525* (1.613) Z=0.2946 P>Z 0.768 **Robust:** Z=0.4360 P>Z 0.663	88 133 77 109 81 117 65 84 85 125
Bandwidth control (narrow)	*2285* (17621) Z=0.1297 P>Z 0.897 **Robust:** Z=0.0144 P>Z 0.988	*2.4498* (3.546) Z=0.6909 P>Z 0.490 **Robust:** Z=0.0992 P>Z 0.921	*11.286* (206) Z=0.0548 P>Z 0.956 **Robust:** Z=0.0131 P>Z 0.990	*.2691* (1.343) Z=0.2004 P>Z 0.841 **Robust:** Z=0.3451 P>Z 0.730	*.3401* (2.687) Z=0.1266 P>Z 0.899 **Robust:** Z=0.0134 P>Z 0.989	40 48
RD time covariate	*-1296*(7942) Z=0.1632 P>Z 0.870 **Robust:** Z=0.0479 P>Z 0.962	*.8948* (1.7864) Z=0.5009 P>Z 0.616 **Robust:** Z=0.4087 P>Z 0.683	*19.16* (105.13) Z=0.1822 P>Z 0.855 **Robust:** Z=0.0667 P>Z 0.947	*.8356* (.995) Z=0.8398 P>Z 0.401 **Robust:** Z=1.0548 P>Z 0.292	*.1914* (1.531) Z=0.1250 P>Z 0.901 **Robust:** Z=0.2816 P>Z 0.778	81 117 73 101 85 125 65 84 85 125

RD time covariate and Lagged gdp *or* region dummy	*534.77* (306.5) Z=1.7450* P>Z 0.081 **Robust:** **Z=1.7408*** P>Z 0.082	*.87972* (1.788) Z=0.4921 P>Z 0.623 **Robust:** Z=0.4122 P>Z 0.680	*-2.534* (4.876) Z=0.5196 P>Z 0.603 **Robust:** Z=0.4817 P>Z 0.630	*.81521* (.9105) Z=0.8954 P>Z 0.371 **Robust:** Z=1.1422 P>Z 0.253	*.0432* (.0892) Z=0.4845 P>Z 0.628 **Robust:** Z=0.5310 P>Z 0.595	71 109 73 101 90 157 65 84 71 109

- Number in *italic* is the coefficient with the number in brackets () representing the standard deviation. A Z-score above 1.65 (90% significant) is indicated with one *, with ** and *** representing a Z-value of 1.96 and 2.58.

Table of results 3

The table (3) provides an overview of the results of the *rdrobust* command for the five main outcome variables. The rows represent four different variations of the RD-regression. The first row includes no controls and includes the two untreated region. The second row drops the *ut* and *nh* regions. The third-row controls with a much narrower bias bandwidth of 5 observations on each side of the cut-off; as is expected, there is a significant drop in the Z-value for each region. The fourth and fifth row introduce new control variables. The time variable (varname: *year*) controls for time fixed-effects and thus more accurately represents the actual effect of the treatment. The fifth row includes time *and* lagged values of total value-added / labour (for variable *gdpa, labour & rel) or* a region dummy for the variables that represent growth of value-added and FTE's within regions.

We find that, although all coefficients point to a positive relationship between the establishment of an RDA and economic development, only one result shows a significant result. With a Z-value of 1.74 (>1.65) there is a significant effect of the establishment of an RDA on the total Value-added within a region, but only when controls for lagged GDP and time fixed effect are included in the regression discontinuity design. Overall, most coefficients do not show a significant effect. The establishment of an RDA in a region does not lead to a significant jump in economic output, either through increased (growth of) labour force or through an increase value-added, compared to the years before the establishment of an RDA.

Difference-in-difference design

Variable:	gdpa	Gdpb	Labour	labchange	Rel	Effective N
Difference-in-difference analysis	*-9124.84 (*6802.95*)* Z= -1.34 P>Z 0.207	*-.60231* (.70588) Z= -0.85 P>Z 0.412	*-32.695* (36.04) Z= -0.91 P>Z 0.384	*-.92642* (.71113) Z=-1.30 P>Z 0.219	*.571719* (.51007) Z=-1.12 P>Z 0.286	87 101 93 109 93 109 75 84 93 109
DID with lagged variable	*95.24244* (93.53554) Z=1.02 P>Z0.330	*X*	*-3.136* (2.9404) Z= -1.07 P>Z 0.309	*X*	*-.0271* (.05918) Z=-0.46 P>Z 0.656	
DID without untreated regions	*-3477.5* (5844.9) Z=-0.59 P>Z 0.567	*-.0913* (.7623) Z=-0.12 P>Z 0.907	.1802 (31.028) Z= 0.01 P>Z 0.995	*-.688992* (.58699) Z=1.17 P>Z 0.271	*1.0620* (.5382) **Z= 1.97**** P>Z 0.080	88 133 77 109 81 117 65 84 85 125
DID without untreated regions + lagged variable	*224.85* (119.26) **Z=1.89*** P>Z 0.092	*X*	*-2.075* (3.627) Z=0.57 P>Z 0.581	*X*	*.0617471* (.043038) Z= 1.43 P>Z 0.185	

- Number in *italic* is the coefficient with the number in brackets () representing the standard deviation. A Z-score above 1.65 (90% significance) is indicated with one *, with ** and *** representing a Z-value of 1.96 and 2.58.

Table of results 4

For the difference-in-difference analysis of panel data the command *xtdidregress* is used. The regression includes both the group and time component of the panel data, the treatment (rda) and the outcome variable. For the first two rows, using all cases, the treatment variable *rda* is considered as being binary (outcomes, however, do not differ from continuous treatment). The regressions without untreated regions *nh* and *ut* state treatment as being continuous, which allows us to measure the treatment effect on only the treated regions.

The DID-analysis estimates the Average Treatment Effect, this estimate adjusted for panel and time effects by adding time and period dummies for each regression. The DID-analysis measures changes in trend for individual cases over a longer period of time, where the RD-analysis only compares the means of all (grouped) regions before and after the treatment. The DID-analysis thus allows for measuring long-term economic effects of the establishment of an RDA.

Where possible, a lagged variable is introduced as a covariate. This is the case for the variables *gdpa, labour* and rel. The output reports the robust coefficient, standard error, Z-statistic, the P-value, and the 95% confidence interval. For the sake of readability, the confidence interval is not reported in the table. The last column includes the effective N of each analysis, with the upper value representing the N left and right of the cut-off for the first analysis from the left, and so on.

Surprisingly, there are exclusively negative correlations for the basic DID-analysis with all regions included. However, none of these outcomes has a Z-value large enough to be considered significant. The effect of the treatment shifts toward a positive relationship as lagged variables are introduced and the two untreated regions are dropped from the sample. Two results are indicated as being significant. Firstly, there appears to be a positive treatment effect on the relative size of the regional economy within the Netherlands for only the treated regions. Secondly, the DID-analysis finds a positive treatment effect on the total Value-Added of treated regions, but only when the lagged variable (=gdpa-1) is included. However, for most coefficients there is no significant effect of the RDA treatment. This gives the impression that there is only a minor effect of the treatment.

Thus, the second null hypothesis, *the establishment of a regional development agency has no significant effect on the economic development of the region in which it is located*, can be rejected.

Effects on RDA's on neighbouring provinces

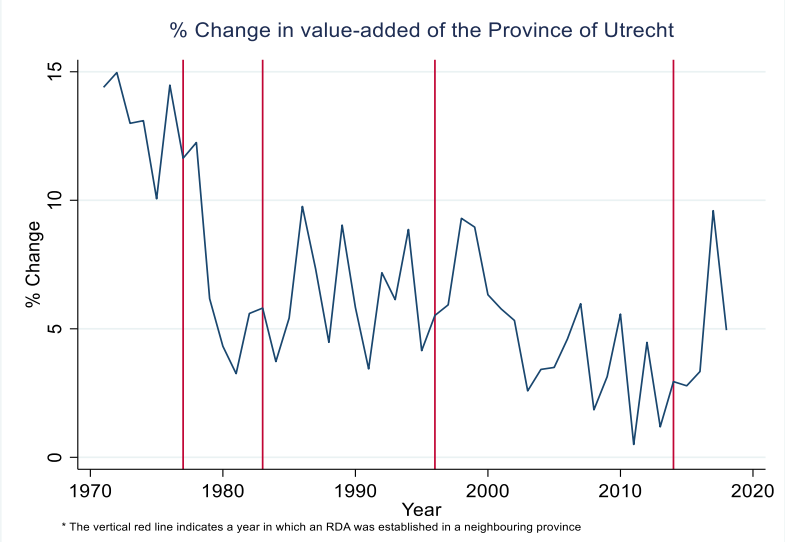


Figure 5: change in economic growth for Utrecht

The final section of data-analysis focusses on the effects of the establishment of RDA's on economic development in other provinces. This is measured through time-series data of the province of Utrecht. A new variable *eventtime* is constructed that measures the distance from the variable *year* to the closest year in which an RDA has been established. For example, for the year 1986 is closest to 1983 when the RDA in the province Noord-Brabant was established. The measure *eventtime* therefore is 1986-1983 = 3. The year 2011 is closest to the RDA in Zuid-Holland, which was established in 2014, the variable *eventtime* equals 2011-2014 = -3.

The Stata-method of *rdrobust* by Calonico et al. (2017) is used to analyse whether or not there is a significant difference in economic development before and after the establishment of an RDA in a neighbouring province. All outcomes are corrected for inflation and include time fixed effects. Results report the coefficient, standard deviation and Z-value for the conventional RD method, and the Z-value for the robust RD design. The *rdrobust* algorithm selects the optimal bandwidth. Results are reported in the table below.

Variable	Conventional	Robust (Z-Value)
% Change value-added *(gdpb)*	-*.22764* (3.1407) -0.0725	-0.2073
Gross value-added *(gdpa)*	-*15.756* (3083.1) -0.0051	0.0459
% Change FTE's *(labr)*	.*63273* (2.1888) 0.2891	0.2620
Total FTE's *(lab)*	. -*3.5848* (22.093) 0.1623	-0.0059
% Share of total GDP *(rel)*	-.04494 (.18449) -0.2436	0.0305

Table of results 5

The findings show no significant effect of the establishment of an RDA in a neighbouring province on the economic development of the province of Utrecht in both the conventional and the robust outcomes of the RD-analysis. Thus, the third null hypothesis*, the establishment of a regional development agency has no effect on the economy of surrounding regions*, cannot be rejected.

Conclusion & Discussion

This research started with the observation that the entirety of the Netherlands is now covered by regional development agencies, with the first RDA being established as far back as 1974, and the most recent one in 2021. This development is not unique to the Netherlands, with RDA's being established all across Europe (Halkier, 2011). The establishment of RDA's is seen as a sign of regionalization, as regions and/or provinces gain more autonomy in regard to the development of economic policy through their regional development agencies. Typically, regional development agencies have a very broad toolset, with economic development being the primary goal.

However, there is also uncertainty in the existing literature on several interrelated topics regarding decentralization of economic policy and the effectiveness of local economic development. There is uncertainty surrounding the economic distributional effects of globalization and decentralization on regions, with evidence pointing towards a converging, but also towards a diverging effect (World Bank, 2008; Gardiner et al., 2004; Dijkstra, 2013). Through measuring converging of Dutch provinces from 1970 through 2016, this study hopes to add to this discussion. On first glance, the findings support the proposition that regions have been diverging. Results show a significant divergence between Dutch provinces for Value-Added per region. More thorough analysis allows for a more nuanced picture: although, overall, provinces are diverging, this significant divergence is due to five provinces lagging behind in economic development. The provinces can be divided into three groups: the first, and largest, group is showing significant convergence over the measured time periods. The second and third group consist of provinces that can be labelled as the periphery; their economies have significantly slower growth. Interestingly, these lagging regions have all established an RDA relatively early, with some frontrunning regions being the later adopters. This seems to suggest that decentralization of economic policy does not guarantee lagging regions to catch up with the frontrunners.

This does not mean that establishing an RDA within a region does not yield positive effects on the overall economy. Lagging regions, as well as frontrunners, might have very well have benefited from their increase in economic autonomy. The literature on this question is, once again, uncertain. There are signs that RDA's and local economic policy in general, could yield significant and strong effects for the economic performance of a region (University of the Free State, 2019; Porter, 1998). The opposite could also be true, as the literature also defines major pitfalls to decentralization of economic policy and RDA's in specific (Malecki, 2002; University of the Free State, 2019). In this study these claims are tested in two ways: with a regression-discontinuity design and a difference-in-difference design. With time fixed effects and lagged variables included, through both methods the study finds that the establishment of an RDA has a significant positive effect on the total value-added of included regions over time. Through the Difference-in-Difference method there also is a significant positive effect of the establishment of an RDA on the relative size of the regional economy. This means that the economy of regions with an RDA will become relatively larger than comparable regions who do not receive the RDA 'treatment'. All other effects were found to be not significant; suggesting that the overall effect of an establishing an RDA is rather small.

The third, and final, question that was prominent in the literature is related to the competitiveness effect of decentralization of economic policy. The establishment of an RDA in one region could lead to higher economic development in that particular region, but it is unclear whether this increased growth happens at the expense of other regions in the area. If this is the case, the establishment of an RDA would make sense for regions themselves, but not so much for the nation as a whole.

Increased competitiveness between regions could lead to a 'race to the bottom' but not increase, or even decrease, national economic development in that process. After analysing the economic development of the central province of Utrecht, the RD analysis finds no significant effect of the establishment of RDA's in surrounding regions on the economic development of Utrecht. Thus, finding no evidence in support of the (negative) competition effect of RDA's.

Overall, the findings in this study leave us with some interesting observations. Several regions that were very early in the adoption of a regional development agency have significantly diverged, as in: having lower economic development, from the other regions in the Netherlands. On top of this, the study only finds significant treatment effects when the two untreated regions of Utrecht and Noord-Holland are not included. This seems to suggest that, although an RDA would have positive effects on economic development, other factors weigh far more heavily in determining the economic success of a region. This does not mean that decentralization of economic policy is not a good idea, as the two mentioned regions might have increased economic autonomy through means other than the establishment of an RDA.

Apart from the scientific relevance, this study has also tried to be socially relevant. The regional development agency, amongst other regional organizations, seems to grow ever more popular as an instrument for economic policy, without there being a lot of evidence available on to support effectiveness. In this sense, the study does provide some arguments in favour of this new line of decentralized economic policy. It seems that most regions are the very least better off with an RDA than without one. However, this is not the same as a cost-benefit analysis; even if there were no significant effects of RDA's on economic policy, it could still be an effective policy option if the RDA requires less funding than national agencies to perform the same task; for this idea we found some support in the existing literature.

To conclude the establishment of a regional development agency seems to yield some minor significant effects for the treated regions. Only a handful of outcomes were found to be significant, suggesting a limited effect of RDA's on economic development. However, they have not prevented significant divergence of Dutch regions in economic development. Decentralizing economic policy as an (unintended) response to globalization is therefore not unjustified, but also not sufficient if the goal of policy is to prevent differences between regions to increase further.

Limitations

There are some limitations for studying the effect of regional development agencies on economic development in Dutch regions. The two regions that are labelled as 'untreated' in the data-analysis of this study actually have established an RDA in 2020 (Utrecht) and 2021 (Noord-Holland). However, given that this study is done in 2022, there is just too little (reliable) data available to be able to include these two regions in the data analysis. If later studies do include all regions, it could be interesting to analyse whether RDA's have the same effects on different types of regions. However, for these types of data-analysis, it seems more fitting to perform a large-N study. We know from studies of Halkier (2011) that RDA's are very widespread within Europe. Although the regions and RDA's within this study are very comparable, a study with a larger variation could be useful to determine whether or not RDA's, and through that; decentralization of economic policy, have equal effects for every region, or whether other regional characteristics are relevant in determining this effect.

This could also make up for another potential limitation of this study: the lack of historical regional data. As mentioned in the literature review, RDA's mainly aim to increase economic activity within the region, but do so through various different means such as: investing in education, the labour market, attracting international companies etc. It would be very interesting the analyse the effect the establishment of an RDA has on these various factors, rather than just looking at the effects on economic development as a whole. However, there is very limited data available from 1970 through 1991 that is measured on a regional level. A large-N study could include more regions for which this information is available. Having a larger number of cases could also lead to finding more significant results, where many coefficients in this study (see table of results 3,4) were too low to be considered significant.

Finally, the measurement of potential negative competition spill over effects of regional development agencies on surrounding regions was done through one single region. Although, as is stated in the methodology, Utrecht can be considered as the region that is most likely to show these competition effects; no significant effects were found. The study of this effect in the Netherlands is limited by two factors: firstly, several RDA's were established in years that were close to each other, limiting the time frame in which we would expect to see the highest competition effect. Secondly, several regions share an RDA, it is unlikely that regions that share such an agency would be motivated to compete with each other. Repeating the analysis for multiple regions from countries not affected by the aforementioned limitations could provide more insight into potential competition effects.

Appendix tables & Graphs

Appendix Table 1 / Classification of RDA's in the Netherlands.

	Funding	Autonomy	Goals
ROM Utrecht Region	Multi: National, Regional & Local.	At arm's length.	Strategic/Invest/Labour/Promotional/Capacity
In-west Noord-Holland	Multi: Local, national, regional.	At arm's length.	Strategic/Invest/Labour/Promotional/Capacity
BOM Noord-Brabant	Multi: National, Regional.	At arm's length.	Strategic/Invest/Labour/Promotional/Capacity
Horizon Flevoland	Multi: Regional, national.	At arm's length.	Strategic/Invest*/Labour/Promotional/Capacity
Innovation Quarter	Multi: National, regional, local.	At arm's length.	Strategic/Invest/Labour/Promotional/Capacity
Impuls Zeeland	Multi: National, regional, local.	At arm's length.	Strategic/Invest/Labour/Promotional/Capacity
NOM Noord-Nederland	Multi: National, Regional.	At arm's length.	Strategic/Invest/Labour/Promotional/Capacity
Oost-NL	Multi: National, Regional, local.	At arm's length.	Strategic/Invest/Labour/Promotional/Capacity
LIOF Limburg	Multi: National, Regional.	At arm's length.	Strategic/Invest/Labour/Promotional/Capacity

Funding = Stakeholder analysis **Autonomy** = Very autonomous on every goal, except for investing, where they seem reluctant because of stakeholder's demands. **Goals** = In general, all RDA's seem to have goals that are defined differently but coincide with the theoretical goals. International, invest and regional cooperation are the main pillars on which Dutch RDA's are build.

*The invest-department of Horizon Flevoland was a separate organisation up until 2019, they were however, both established in the same year.

Source: Ecorys (2016) and organizational websites.

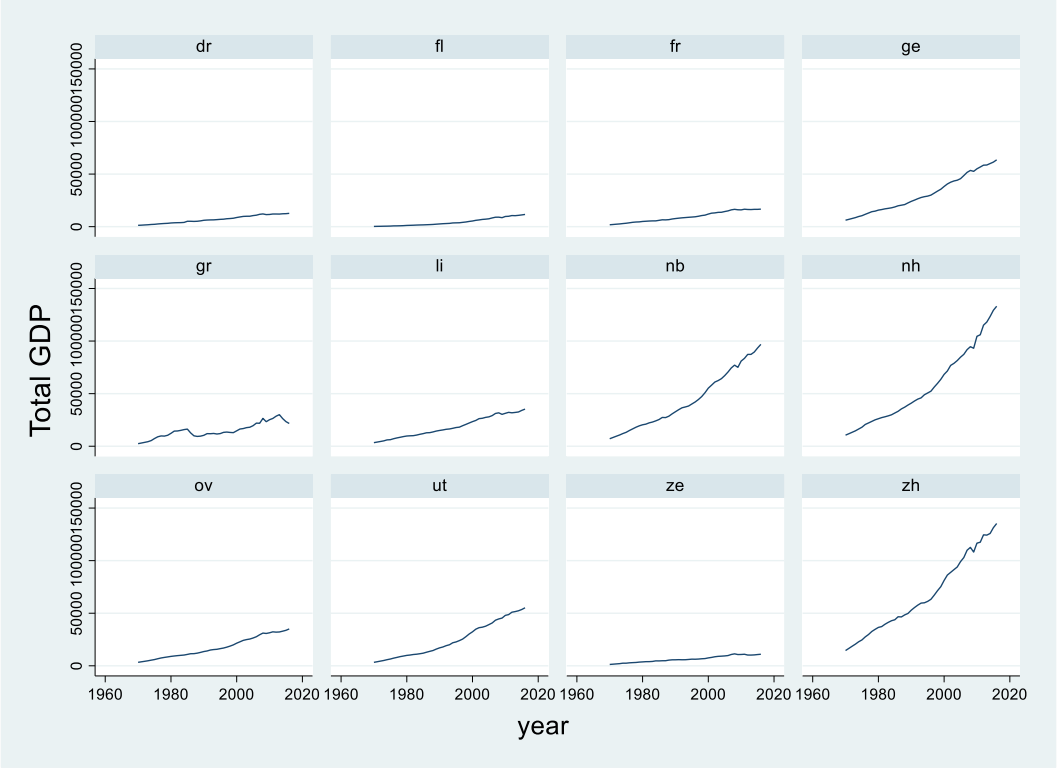
Appendix table 2 / descriptive statistics for the panel data.

Variable		Mean	Std. dev.	Min	Max	Observations	
gdpa	overall	24516.7	26652.24	222.2222	134914.3	N =	564
	between		20195.27	4312.264	65416.9	n =	12
	within		18325.29	-26979.7	101986.5	T =	47
labour	overall	424.6348	355.8274	7.9	1520.6	N =	564
	between		355.4554	64.31915	1142.449	n =	12
	within		102.8976	224.6826	863.3826	T =	47

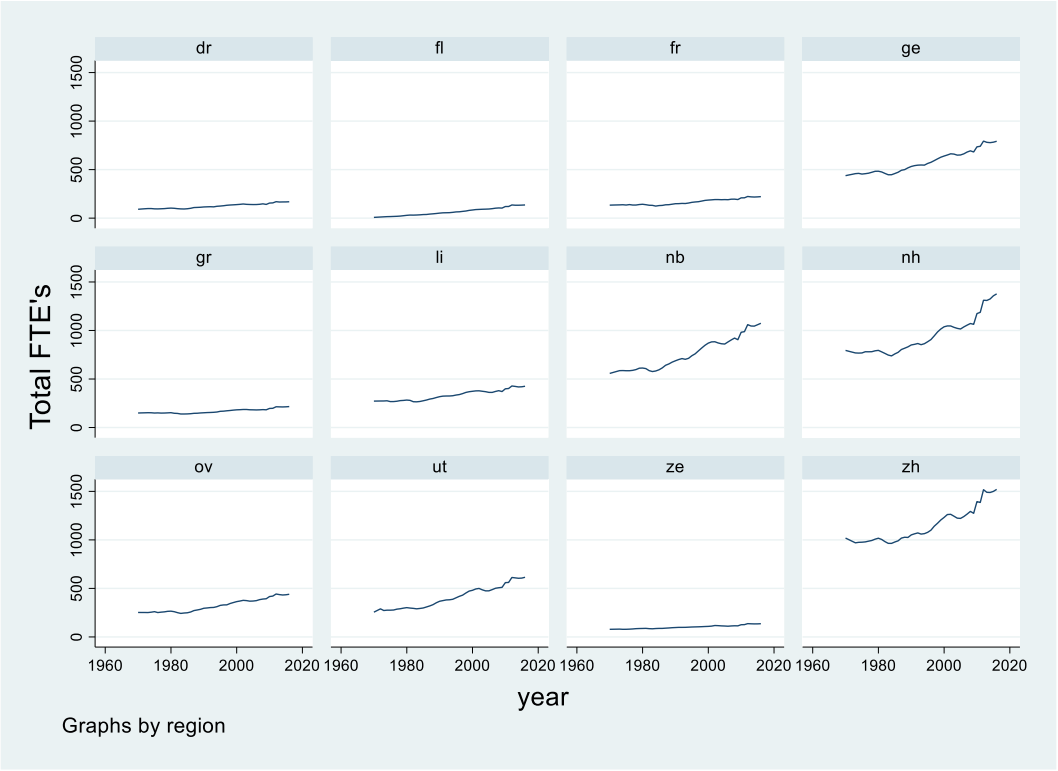
Appendix table 3 / Stata variables and meaning

Variable Name	Meaning
year	Time variable, yearly
Reg / st	Region name / corresponding number
gdpa	Total value-added corrected for inflation in year T
gdpb	Change in value-added compared to T-1
laggdp	Lagged variable of gdpa (T-1)
Labour	Total FTE's in year T
labchange	Change in total FTE's compared to T-1
laglab	Lagged variable of Labour (T-1)
Rel	% share of national GDP
lagrel	Lagged variable of Rel (T-1)
rda / rday	RDA dummy / year of establishment RDA
Eventtime	year-rday

Appendix graph 1 / Total Value-Added per province, over time.

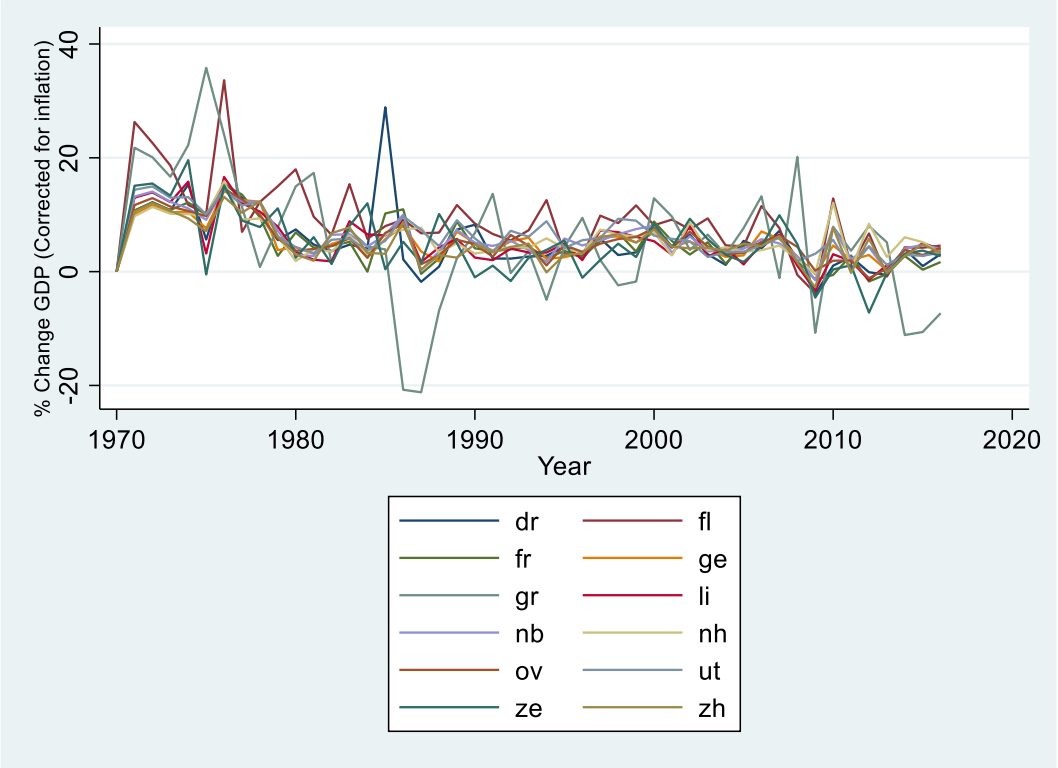


Appendix graph 2 / Total FTE's per province, over time.



Appendix graph 3 / Change in value-Added and FTE over time, per province.

Appendix graph 4 / change in GDP 1970-2016 all regions



References

Bond, P. (2018). Debates in local economic development policy and practice. In *Local Economic Development in the Developing World* (pp. 57-74). Routledge.

Calonico, S., Cattaneo, M. D., Farrell, M. H., & Titiunik, R. (2017). rdrobust: Software for regression-discontinuity designs. *The Stata Journal*, *17*(2), 372-404.

Centraal Bureau voor de Statistiek. (2015, February 24). *Werk in Randstadprovincies voor ruim 80 procent in dienstensector*. CBS. https://www.cbs.nl/nl-nl/nieuws/2015/09/werk-in-randstadprovincies-voor-ruim-80-procent-in-dienstensector

Council of Europe. (2009). *Regionalisation*. Congress of Local and Regional Authorities. Retrieved May 15,

2022, from https://www.coe.int/en/web/congress/regionalisation#{%22123051896%22:[]}

Dijkstra, L. (2013). Why investing more in the capital can lead to less growth. *Cambridge Journal of Regions, Economy and Society*, *6*(2), 251-268.

Du, K. (2017). Econometric convergence test and club clustering using Stata. *The Stata Journal*, *17*(4), 882-900.

Ecorys. (2016, May). *Evaluatie van de Regionale Ontwikkelingsmaatschappijen*. Ministerie van Economische Zaken.

Evans, R., & Harding, A. (1997). Regionalisation, regional institutions and economic development. *Policy & Politics*, *25*(1), 19-30.

Gardiner, B., Martin, R., & Tyler, P. (2004). Competitiveness, Productivity and Economic Growth across the European Regions. Retrieved February 16, 2015.

Garretsen, H., McCann, P., Martin, R., & Tyler, P. (2013). The future of regional policy. *Cambridge Journal of Regions, Economy and Society*, *6*(2), 179-186.

Goldblatt, D., Held, D., McGrew, A., & Perraton, J. (1997). Economic globalization and the nation-state: shifting balances of power. *Alternatives*, *22*(3), 269-285.

Halkier, H. (2011). Regional development agencies: European trends and experiences. *The Proceedings of 1st*, 1.

Halkier, H. (2012). Knowledge dynamics and policies for regional development: Towards a new governance paradigm. *European Planning Studies*, *20*(11), 1767-1784.

Halkier, H., & Danson, M. (1997). Regional development agencies in Western Europe: a survey of key characteristics and trends. *European Urban and Regional Studies*, *4*(3), 243-256.

Isaksen, A. (1998). Regionalisation and regional clusters as development strategies in a global economy.

James, L., & Halkier, H. (2016). Regional development platforms and related variety: Exploring the changing practices of food tourism in North Jutland, Denmark. *European Urban and Regional Studies*, *23*(4), 831-847.

Jovanić, T. (2019). Regional Development Agencies within the Governance Structures for Regional Development in the Countries of the Former Yugoslavia. *Lex Localis-Journal of Local Self-Government*, *17*(3).

Kim, S., & Shin, E. H. (2002). A longitudinal analysis of globalization and regionalization in international trade: A social network approach. *Social forces*, *81*(2), 445-468.

Lawrence, F., & Rogerson, C. M. (2019). Local economic development agencies and peripheral small-town development: Evidence from Somerset East, South Africa. *Urbani izziv*, *30*, 144-157.

Lengyel, I. (2009). Bottom-up regional economic development: competition, competitiveness and clusters. *Regional Competitiveness, Innovation and Environment*, 13-38.

Malecki, E. (2004). Jockeying for position: what it means and why it matters to regional development policy when places compete. *Regional studies*, *38*(9), 1101-1120.

Malizia, E., Feser, E., Renski, H., & Drucker, J. (2020). Understanding Local Economic Development (2nd ed.). Routledge. https://doi.org/10.4324/9780367815134

McDonald, F., Huang, Q., Tsagdis, D., & Josef Tüselmann, H. (2007). Is there evidence to support Porter-type cluster policies?. *Regional Studies*, *41*(1), 39-49.

Mountford, D. (2009). Organising for Local Development: The Role of Local Development Agencies. Summary Report, 26-27 November 2009, working document, CFE/LEED, OECD. Retrieved fromwww.oecd.org/dataoecd/54/41/44682618.pdf?contentId=446

Nel, E. L. (2019). *Regional and local economic development in South Africa: The experience of the Eastern Cape*. Routledge.

Phillips, P. C., & Sul, D. (2009). Economic transition and growth. *Journal of applied econometrics*, *24*(7), 1153-1185.

Pike, A., Coombes, M., O'Brien, P., & Tomaney, J. (2018). Austerity states, institutional dismantling and the governance of sub-national economic development: The demise of the regional development agencies in England. *Territory, Politics, Governance*, *6*(1), 118-144.

Porter, M. E. (1998). *Clusters and the new economics of competition* (Vol. 76, No. 6, pp. 77-90). Boston: Harvard Business Review.

Porter, M. E. (2007). *Clusters and economic policy: Aligning public policy with the new economics of competition*. Institute for Strategy and Competitiveness at Harvard Business School.

Rijksoverheid. (2013, August 1). *De ruimtelijke structuur van de Pieken in de Delta*. PBL Planbureau voor de Leefomgeving. https://www.pbl.nl/publicaties/de-ruimtelijke-structuur-van-de-pieken-in-de-delta

Rogerson, C. (2018). *Local economic development in the changing world: The experience of Southern Africa*. Routledge.

Ruimtelijk Planbureau. (2007). *Verhuizingen van bedrijven en groei van werkgelegenheid*. NAi Uitgevers.

Technopolis. (2014, August). *Verschuivende paradigma's in het ruimtelijk economisch beleid*. https://www.technopolis-group.com/nl/report/verschuivende-paradigmas-in-het-ruimtelijk-economisch-beleid/

Thompson, G. (2000). Economic globalization. *A globalizing world*, 85-126.

Toktas, Y., Botoc, C., Kunu, S., & Prozan, R. (2018). The regional development agency experiences of Turkey and Romania. *Business and Economics Research Journal*, *9*(2), 253-270.

University of the Free State. (2019). *Rethinking LED: "Local Economic Development" in Intermediate Cities*. South-African Cities Network. https://www.sacities.net/wp-content/uploads/2020/03/Rethinking-LED-Local-Economic-Development-in-Intermediate-Cities.-Released-2019.-pdf.pdf

Van Hoogstraten, P. (1983). De ontwikkeling van het regionaal beleid in Nederland 1949-1977: een verkenning van de mogelijkheden en grenzen van overheidsingrijpen in de ruimtelijke struktuur.

Wageningen University & Research. (2014). *REGIONAAL ECONOMISCHE SAMENWERKINGSVERBANDEN: OVERZICHT EN TYPOLOGIE*. https://edepot.wur.nl/524406

World Bank. (2008). *World development report 2009: Reshaping economic geography*. The World Bank.