Employment, Unemployment and Municipal Policy in the South Holland Province

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I. Introduction

The topic of unemployment policies has been widely disputed for the last thirty years. The discussion has been fuelled significantly by Michael Porter (1995) who critiqued government intervention in inner cities to spur on employment, and his arguments are largely debated nowadays as well. This critique was grounded in the reasoning that the government does not "feel" the market and can do more harm than good. His evidence suggested previous failures of such government interventions. The proposed solution to the given problem was to involve the private sector, to close the gap between the public and the market (Porter M. , 1995). Naturally such statements did not go without a response: various researchers from different backgrounds and scientific interests have argued that Porter's strategy would not work: the issue is not one for purely market procedures. Dymski (1996) argues firstly that Porter criticizes subsidy intervention too harshly: according to Dymski, there has not been enough subsidy to discourage work. He argues that Porter views the world through an erroneously jaded lens: nothing is perfectly distinguishable, nothing is of clear information – and because of such thinking, also lack of policy effect is not as easy to prove. Dymski pointed out that those subsidies can be of a supportive nature: for example, in child care so that parents could work (Dimsky, 1996). He then goes to suggest financial restructuring as a possible solution: to make borrowing and lending more fluid. Fainstein and Gray (1996) argue further that government intervention (as suggested by Porter) that is aimed at private sector interests, would rarely take welfare into consideration of the worst affected areas. Their proposed solutions were to finance agglomeration of industries that use the competitive advantage of an inner-city area. Hunts Point market was used as an example of a successful policy – it was a government financed initiative to improve the employability of the Hunts Point area in the USA, a food processing centre was built to be used by private companies, and it was required to hire the local population. This decreased unemployment, and by so doing improved welfare of the people living there. There is potential in fostering such industries and they can become self-sustaining (Fainstein & Gray, 1996). Authors Butler (1996), and Blakely and Small (1996) also add the dimension of race and a continued poverty trap to the discussion. They argue that race would play an important role in the issues faced by the inner city, and also that even if problems are solved by a successful policy, this simply leads to migration outwards from the area and then the cycle starts again in other places (Butler J. , 1996), (Blakely & Small, Michael Porter: new gilder of ghetto's, 1996).

All this discourse is still relevant today, and there is a clear need to identify whether government policy is effective. Should the local government engage with the labour market to solve employment and unemployment problems and mismatches and do their efforts pay off? The problem that I would like to outline in this work is that the use of case specific examples suggests that a policy may work for one target group in a specific place, whilst not working in the same or different groups in the same or different places. Place- and group specific heterogeneity is crucial in understanding the relation to policy – labour market performance. Yet, contingency arguments should not replace generalizability. The approaches that were engaged within the 1995 debate were case specific, Hunts Point Market has worked at Hunts point as part of government expenditure on the specific issue of unemployed, low-skilled local population. But does it always work when government intervenes in such a way? Porter also argues for government intervention, just in a more market-friendly way, then gets criticized because that approach is argued to not have worked by his opponents using case specific examples. My paper will attempt to create a method of evaluating policies in a more generalized way – using variables that can be applied to all units of study and to represent what the argument between Porter and his criticizers is about.

Research Question

To understand about policy in general, one has to delve deeper into the understanding of how policies came to be: In the first half of the 20th century there was a predominant outlook that aggregate demand policies – as supported by John Maynard Keynes – were to solve the problems of unemployment and poor economic growth: increased expenditures on goods and services that are created through lower taxes would create demand for goods, this demand would need to be met with increased supply, the supply would be created by expanding production and hiring more workers, thus reducing unemployment, due to the heavily enlarged war-time economy in the United States of America, but then in the 1970s, a discovery was made of stagflation – rising inflation and unemployment, this hinted that aggregate demand policies are not the penultimate solution to the problem to falling gross domestic product and rising unemployment – they cause inflationary pressures that do not result in the intended economic benefits of smaller unemployment. Furthermore, excessive taxation, like that in Denmark has led to large public deficits, a long term disadvantageous factor in the economy. Devaluation policies to increase competitiveness also ceased usefulness in a more globalized world. From the 1990's there are also intentions to alter the composition of the labour force by "juggling" labour supply: by creating schemes of early retirement for the old, to be replace them by the young. Wage moderation strategies were suggested: more productivity based pay and curbed wage increases (to lower the relation between inflation and wages, thus lowering inflationary demand) – these were disputed among economists for their effectiveness. Excessive social security has also surfaced as a possible negative determinant of long term unemployment through the dulled skills of the worker over time. Literature also emerged on all sorts of flexibility: that of labour hours, labour protection, and, in response to the previously mentioned point – workfare, benefits based on the amount of work done. (Andersen & Halvorsen, 2002)

The previously discussed literature suggests that unemployment and or falling GDP is, over time, viewed in different ways as a problem and about the changing circumstances under which it is combated: from the extremes of supply side versus demand side policies, to the generosity of social security and social controls to discourage as well as solve unemployment, this all is done in the foreground of a more globalized economy and rising impacts of technology on the human society. Therefore, knowing the past, it is important to evaluate the present: do the policies with a basis in the past still work in the present - Does any kind of intervention work, if so – what works better: to intervene directly or to accommodate the market processes?

The following research question we want to be answered:

What works better for combating unemployment, direct intervention or economic facilitation, when tested on the municipal level in South Holland?

From this research question, hypotheses will be created based on type and or category of unemployment policy, to be evaluated, based on available data, in the result section of this paper. This implies the following two hypotheses:

Hypothesis 1: *Direct intervention policies lower unemployment, ceteris paribus.*

Hypothesis 2: *Economic facilitation policies lower unemployment, ceteris paribus.*

These two hypotheses will be a basis upon which the policies will be tested, however, there is more to hypothesize: Porter clearly had a strong belief in the government as a facilitator of economic activity rather than that of an interventionist. The government should encourage business through investments into business-related infrastructure (factories, subsidies, grants). Ex ante and ex post the critique he received from different economic thinkers, he provided cases as evidence to support the non-interventionist

perspective. In all cases he has made argumentation to counter the points of his opponents, however, these opponents would then also use case-specific examples to prove their points. This means that the whole procedure becomes rather hard to apply to economic theory. It creates a vacuum, a Schrödinger's Cat-like economic policy: It is both correct to intervene and incorrect to do so at the same time. This thesis will provide analysis of these difficult questions and produce insight in the statistics that it will use. Considering this duality, and in accordance to my beliefs, therefore, I would like to propose the third hypothesis which will also be tested in this work:

Hypothesis 3: *Economic facilitation policies will reduce unemployment more than direct intervention policies, ceteris paribus.*

Based on the arguments (that the government should accommodate, that the inner city is a cluster with its own advantages, and that interventionism does not economically work) of Porter, I would also like to draw eyes to two reasoned arguments. Firstly, one cannot build a house with no structural support: Given these arguments, it is highly likely that without good economic and physical infrastructure there isn't a possibility for successfully employing the population in question. Secondly, contrary to his critics, Porter portrays the disadvantaged people of the inner cities as motivated potential workers that suffer from a changing world because of their inability to change with it. They want to work and they want to better themselves, but the outdated physical and education infrastructure does not allow these people to attempt to build their lives for by themselves. Porter argues that this is exactly where the government could encourage businesses to hire locals, could provide infrastructural improvements to make commuting easier and could potentially do much more without directly tampering with the labour market. I have found Porters arguments to be more convincing than that of his opposition and hence why I believe that it is the facilitating policies that make the higher, more significant contribution towards fighting unemployment and increasing social wellbeing.

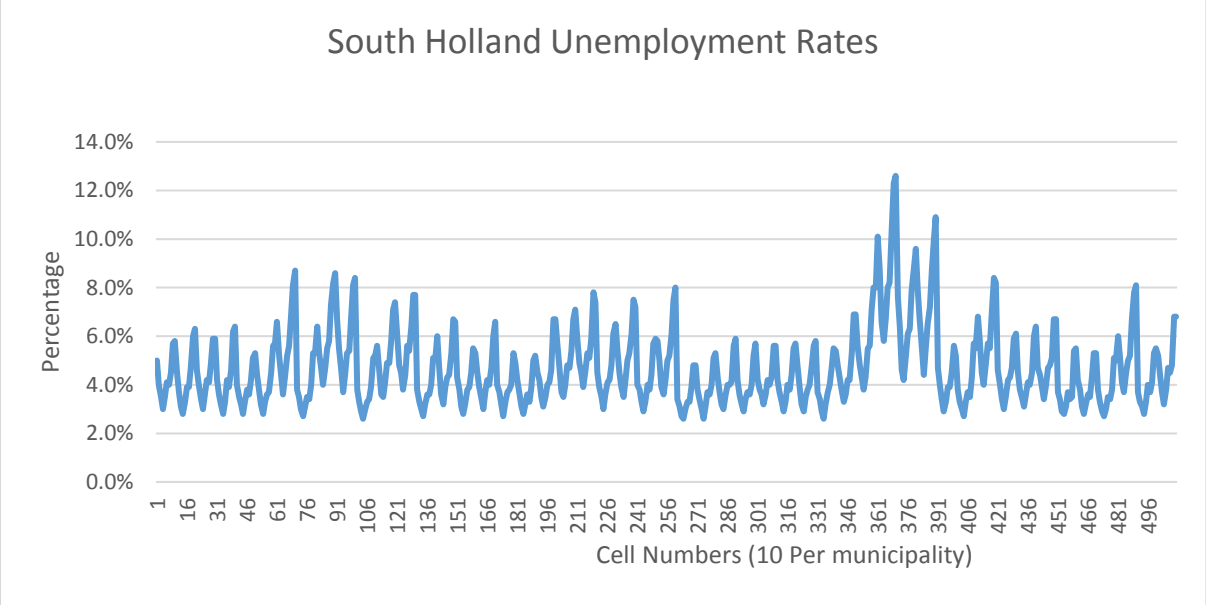


Figure 1

The purpose of this work, therefore, is to shed light upon what category of policy expenditure relates most to employment and unemployment dynamics. Is it better to directly interfere in labour market conditions of people, or is it better to facilitate place-based and firm oriented economic processes like Porter suggests? We use the municipalities in the Dutch province of Zuid-Holland as case study to investigate this. Clearly there are differences between municipalities (arranged alphabetically, then from years 2005 to 2014) in unemployment as shown in figure 1 above – there are potentially even several clusters of

unemployment as can be seen above (in cells 61 to 136, then 196 to 256 and then 346 to 421). This means there is much time- and place-varying variation in unemployment that can be used for analysing its relationship with municipality expenditures in various categories.

The variables to represent direct intervention policies, and market facilitation policies will be gathered from Statistics Netherlands (Centraal Bureau van Statistiek). Along with those, variables that are known to influence unemployment will be gathered to avoid heterogeneity bias – to prevent the statistical program giving too much significance to the previously mentioned variables of interest. In the following economic ideology discussion (theory part of this paper), the examples used to "prove" arguments are often on a case-by-case basis meaning that there are no similar control groups to test whether the support or disapproval of an approach is valid in terms of statistical significance.

This is the outline of my paper. The theory section will provide the Porter debate: the arguments between Porter and his opponents of the issue of direct versus accommodating policy approaches as a solution to unemployment and employment. Together with this, various articles dedicated to unearthing the factors of unemployment are discussed, which will then be used as control variables for the regression model. Variable issues such as lagged variable use will also be discussed here. The data section will focus on the sources of data – national statistics databases of South Holland municipalities– and the procedures to make that data usable in a statistical sense. The data will be in panel format – municipalities over the years. The methodology section will present my self-assembled equation, and variants of that equation for robustness tests. The results section will discuss in depth the variables used and their contributions to the dependent variable, followed by the conclusion as well as limitations, and suggestions for further research.

II. Theoretical Framework

To test unemployment and employment related policies, first one needs to know what those policies are and, secondly, what impacts unemployment/employment apart from policies. Generally, this means that the literature will be arranged in two parts: a section of policies and their found effects on unemployment, and a section of known determinants of unemployment that are distinctive from unemployment policies – variables to use to control for the non-policy effects on the incidence of being unemployed.

Below is included a series of small summaries for literature about the policies of unemployment that will be used to develop a broadly applicable categorization of policies by type and then to test their effectiveness based on the findings in the data section.

Research Aspects and the Porter Debate

To encourage private sector investment, firstly the disadvantages of the inner city need to be addressed (how this relates to the municipalities will be addressed in the paragraphs below): costly redevelopment of brownfield sites and of new infrastructure, high taxes to fund welfare, crime/security issues, and mothballed infrastructural development. Of strong importance is also the population of the inner city: it is too uneducated and incompetent. To address these issues Porter, suggest that the government redirects its resources only where there is absolute need rather than politically influenced bouts of generosity, also to create incentives with those subsidies for people to work. The government is to assume an accommodating role (according to Porter)– one to create an environment for business, and through that – employment growth. The legislation is too heavy for small business owners to navigate and comprehend – this acts as a deterrent that should be removed. Moreover, the training to acquire job-specific skills should be contracted out to the private sector as no one feels the market better than them. Community Based Organizations are to accommodate investments (rather than deciding them), with a social education to encourage work, a managed and assembled pool of workers and an understanding of what their community is competitively good at. Naturally the private sector is to play a role: individuals should be financially enabled (through easier loans) to borrow and to make investments themselves. According to Porter, the private sector should establish relations with the incumbent population. Why should they do that? Because the inner city has many advantages: Firstly, their location within an urban area implies access to demand in all the city, short lead times and proximity to already developed clusters of business (ones to learn from and to compete with). Secondly, the purchasing power of the inner city matches or exceeds that of the other areas – the inner city is an untapped fountain of revenue for those clever enough to seek it. Finally – the people of the inner city may be uneducated; however, they also are willing to work and would accept lower wages whilst also being specialized in social services of the community. All of this provides a fertile ground for private sector investment (Porter M. E., The Competitive Advantage of the Inner City, 1995).

As a reaction to Porters statements, professors Mia Gray and Susan Fainstein provide several issues on the topic of government intervention. Firstly, there were government policies aimed precisely at attracting the private sector and there were expenditures to create a safety net in the light of such experimentation – the government has addressed these issues. Furthermore, just a few years ago, the public Comprehensive Training and Employment Act has been replaced by a Private Industry Council – to address the better "feel" of the market. This decision brought no fruit as the skills still mismatched what was in demand. The government should participate more: to create agglomeration economies within the inner city. The case study used to prove success was that of the Hunts Point Market – a food distribution agglomeration, created and still owned by the government upon which 60 food firms now ply their trade. More than half

of it is crewed by local population. As for the regressive role for the CBO – Porter needs to give them time to learn and develop (Fainstein & Gray, 1996).

Professor John Sibley Butler agrees with Porter, though he sees his ideas as lacking: Porter assumes the inner city to be dependent on outside factors such as skills, ideas, funding. Butler takes a historical look at the entrepreneurial prowess of blacks – there is evidence to say that black entrepreneurship has been successful in the past, indeed almost rivalling that of the incumbent whites. The issue of the inner city is how the skilled and rich flee from it: there is nothing to keep them there. The issue isn't people: its opportunities given to those people. What attracts blacks to stay? Ownership of property, something which was denied to them historically. It is a generational approach – it takes time to succeed. Furthermore, the public education system is more of a detention centre than a place of education – entrepreneurship should become a strong part of it, at the forefront of which should be the private school (Butler J. S., 1996).

Professor Dymski, however, does not see Porters ideas in such a good light: he first outlines that the size of subsidy is small – too small, in fact to be considered an economic waste. Furthermore, location near clusters becomes quite irrelevant due to the increased numbers of clusters surrounding the hypothetical inner city. Overall issues that are seen in the inner city are CAUSED by the market rather than mended by it. Race is also an issue, although there is some, minimal, race based lending – the gap remains and it won't close on its own. Dymski admits that subsidy may undermine competitiveness – but it also finances training and work. Work support facilities such as child care are also financed by public money. Dymski acknowledges that policies are hit and miss and that it is nigh-impossible to divide payments into efficient and wasteful. Locating near firms doesn't automatically mean rising growth – the inner city needs its own growth engine. The greatest issue is lack of capital and lack of institutions to accommodate the accumulation of capital – those moved out during the deindustrialization period, the root cause of the issues. The proposed solution is to augment the financial market – make it easier to get loans. Incentivize private financiers to participate and reward entrepreneurial success. Redevelop the CBO approach to accommodate this (Dymski, 1996).

Although Porter touches on relevant points, he also does so without considering the socio-cultural factors of the inner city, namely the ghettos. Ewald Blakely and Leslie Small discuss endemic ghetto factors and how not addressing them is inefficient. The issue is that all social policies that do work still end up with people leaving the inner city – so all that investment is now moving out. The issue is so great that there are discussions of political and economic separation of blacks and whites. Issues faced are such: even if there are skills, they are shadowed by the bad reputation of the ghetto – the consequence of which is isolation, only the most basic industries can function there, there is lack of re-adapting the inner city to the modern economy. Policies are simply incompetent in dealing with this, as Porter says. Those policies did give rise to some black politicians who address the issues faced. The people problem perception was what lead to this – individuals, not the community benefitted from reforms. The alternative view is that of the place – to regenerate it using locals. Those policies fail as well and the process of place regeneration is politicized. The outstanding solution is to modernise the ghetto – use up to date tertiary industries. Since most skilled people leave the ghetto, the idea is to encourage them to stay through ownership of assets. Encourage work by tax limits and offer education vouchers. The inner city can be its own cluster – all that needs to happen is that the CBO works to encourage business and to create a community – go as far as to pay men for taking care of families (Blakely & Small, Michael Porter: new gilder of ghetto's, 1996)

Michael Porter himself retorts to these arguments because the market can't lead to social optimum because of non-market effects: the bad image created of the inner city, outdated or simply bad policies, and poor communications and incentives to develop. Education (part of human infrastructure) remains the

best solution, especially in terms of business. The government previously engaged in very bad policies and seemed to have forgotten to develop infrastructure – especially public transport. Both the CBO and Government should remain advisers and accommodators for companies: through relaxed policies, non-discrimination in both directions, advice and financial incentives. Social policies need to be efficiently re-assigned and lowered to allow for lowered taxes which would encourage businesses and accumulation of disposable income. The jobs created should match the population: low skill. Even in low skilled jobs there are advancement options (Porter M. E., 1996).

Economic and Employment Policies

In the Porter debate, the main issue is what kind of policy can the government use to efficiently solve the unemployment/employment problems. Porter argues that the government should only invest in activities which accommodate the labour market: if there are incentives for business to happen, it will happen and employment will rise, and unemployment will fall. Dymski and other critics argue that only accommodating the market is not enough: either Porters suggested policies were not enough or they may have worsened the situation – what needs to be done is active intervention into the labour market through government made training schemes and similar programmes that are created to directly influence the rise of employment and the decrement of unemployment. The debate generally distinguishes two types of policies, which will be discussed below.

1) Accommodating economic investments: as addressed by Porter and exemplified by the evidence he provides – a successful economic unit, such as an inner city, is one that funds its economic activities (and through that – growth in employment or decrease in unemployment) well – business must be running as smoothly as possible there. Furthermore, as Butler points out, entrepreneurs should also be accommodated in the same manner. In any case the hypothesis incorporates activities which encourage private sector investment, and, through that, reductions in unemployment in the target unit. So, this thesis will account for such investments by the government into its business environment. The expectation is that economic investments by the government to improve its business environment will be ones that allow for falling unemployment rates among its citizens. Interestingly Dymski, an interventionist, mentions another important factor of government intervention that can be an accommodating policy more clearly: child care expenditures. This expenditure is to facilitate the care of children so that their parents can participate in the labour market.
2) Interventionist employment policies. As argued by interventionists using the Hunts Point Food market, a government initiative. The government must directly involve itself in finding jobs for its population. Clearly, there is reasoning for such arguments – 60% of the food markets labour force were locals – who had gone through the required procedures to acquire the skills necessary to participate in such a market. This is theorized to be a direct consequence of government intervention in combating unemployment, providing reasoning that expenditures on participation/employment policies are the determining factor of employment. Not only that, but for successful policies that impact participation of the population, the government also spends enough resources for administering to the population: monitoring unemployment issues and assigning its resources to solve them. In the case of participation policies, this includes the reactivation of the disabled who are looking for work, but can't find work – the disabled unemployed – a worthy means to counter unemployment within a municipality.

Known factors of Unemployment

Below is included a series of small summaries from literature about the factors of unemployment that will be used to control for the effects of the policies:

Age:

It is generally accepted that older workers face a degree of ageism: a level of discrimination since they are of an advanced age. Lee and Clemons (1985) have found that the variation of approval ratings for older workers to get employed is statistically significant both on absolute (age) and comparative (when faced with a younger worker). Performance information was found to have a statistically significant effect and to always raise approval rate for older workers, but, depending on whether the approval was comparative or absolute, not younger workers. The strongest drop in approval for old age employees was found to be when comparing them with a younger worker: a drop of 20 percent ((Lee & Clemons, 1985).

This implies that there may be a higher incidence of unemployment as age increases – even among the population that is still technically meant to be employed – up to the age of 64. However, the extension of this implication is that older workers would face event greater discrimination. In terms of unemployment policies and a demographics this would suggest that a rising proportion of older age workers would contribute to raising unemployment. The opposite can therefore be said about the younger working age population – employers have a preference of hiring younger workers due to the remaining time that they have in the labour market, among other reasons. It is important therefore to control for the age group variables, as the shear change in the population dynamics could be what relates to either a positive or a negative change in unemployment.

Migrant status:

Based on the findings of Shumway (1993), in theory there are conflicting estimates of how being a migrant would affect the outcomes in the job market. On the one hand migrants may be desperate for a job, thus lowering their reservation wage (minimum wage to persuade them to work), thus becoming more attractive to employers and finally, by being a migrant, raising employment chances. But there is another type of migrant: on whose reservation wage is raised by the cost of moving – it may be that this individual finds it too expensive to seek a job over some geographical distance and would therefore choose not to work, potentially granting a negative coefficient to the relationship between migration status and employment. The type of migration considered is within the nation. This study also considers the locational characteristics such as unemployment rate in the area as proxy for labour demand and whether the area is of an urban nature: this is done under the belief that due to the existence of wage differentials, individuals in rural areas will see different employment patterns. The reasons why people seek a job and the status beforehand also play a role: such as for example voluntary or involuntary nature of unemployment, job experience and the characteristics of the applicant themselves. Those variables are used as controls to see the effect of migration. The findings are such that unemployment duration is only strongly increased if the migrant does not find a job within six months after having migrated. The final finding of this paper is that there is an interaction effect between having recently migrated and receiving unemployment compensation as a positive factor of decreasing unemployment duration (Shumway, 1993).

All in all, this indicates that the status of being a migrant is one that has a different kind of relation to unemployment than that of a native. Due to various reasons migrants may have problems or advantages in the labour market – since the effects on unemployment may be present due to the previously mentioned case, the status of a migrant should be considered as a control variable within my study of unemployment policies.

Urbanization economies:

In their paper Frenken, Van Oort and Verburg (2005), find that increased urbanization – which is approximated by population density, has a negative effect on unemployment growth. In nearly all their tested cases, population density that was increasing led to negative unemployment growth in a statistically significant manner. They have theorized that this is since a higher population density also relates to a lower commuting distance due to more available job opportunities (Frenken, Oort, & Verburg, 2005).

The implications of this are twofold – population density is an inherent characteristic of a location – it makes sense to control for population density in the area. The second reason to include this variable is that it would then act as a reducer of upward bias of overall unemployment policies (due to opportunities) and specifically commuting related policies (due to the lack of need to commute because of density).

Household and marital status:

The previously cited paper, by Partridge and Rickman (1997) also identifies the household as a relevant contributor towards the unemployment within a state. They have found that the states with more households that had a child regardless of whether it was through marriage or not had contributed to raising unemployment. Furthermore, unemployment was seen to be lower in states where there were more married couples. Apart from household status, this paper also reinforces or contradicts the previously mentioned findings concerning population density (urbanization) as well as that of the age-unemployment relationship. Indeed, in American states population density would have a small, but statistically significant negative effect on unemployment rates. The increasing percentage of population of 14 and under (children) has a strong increasing effect on unemployment, however, contrary to previous findings – states with more people aged 65 and upwards see a negative effect on unemployment – unemployment falls as their numbers rise (Partridge & Rickman, 1997).

From the above-mentioned article, the effects of household composition and marital status need to be accounted for as they relate to the rate of unemployment per a spatial unit – such as an American state. Apart from that, population density is consecutively proven to be a statistically significant control variable for unemployment rate as mentioned before. Since the age variables are showing partly unexpected effects, which are still significant, it is important to see how these effects act within the given circumstances within this paper.

Institutions:

The government, local and national, have their own schemes for unemployment protection, as well as other social security provisions – ranging from disability benefits to employment insurance expenditures to counter the risks of redundancies among their employees. Various critics have argued that such security would encourage people to avoid work and to just live on the provided benefits. Since this is an issue that is quite often political as well as it is economical, it is important to account for it and to provide evidence on how this policy would act on its own. The findings of Partridge and Rickman are mixed on this variable – in simple regression the variable significantly contributes to unemployment increases, however upon analysis via panel regression, the findings suggest that a more income/unemployment secure population is also found to be less unemployed among the American states (Partridge & Rickman, 1997).

Industries as factors of employment:

Clearly the previously mentioned (Porter Debate) arguments also concern with skills and industry: what training/education the labour force was given, and what industry is dominant within the area of consideration. Porter in some cases is known to advocate low skill employment, however interventionists are also for that since the Hunts Point food market is one which requires basic skills to operate. It is a traditional factory that provides nourishment processing services to its client firms and the local population. The government maintains a presence there in terms of creation of infrastructure and maintenance. This case specific example indicates that low skilled areas such as food services and traditional factories may contribute to employing a population. It is therefore important to gather industry level data per economic unit to see how the industry type works overall several different areas, not just on a case-by-case basis. However, Porter also receives critique – the populations must adapt to the changing times, if factory-based industries have moved out – this void in the market must be replaced with the development of modern industries and business services – meaning that they theorize that as time progresses, the relative importance of low skilled primary/secondary sector industries would become redundant and will be replaced by those that are better suited to move on with the rest of the world. Do these modern industries contribute to reducing unemployment caused by the structural change of the economy? Overall – all groups of debaters are hinting toward the importance of employment opportunities in types of industry within an area.

Clustering and Scope of Analysis

Porter argues that the inner city, for various reasons, becomes its own cluster. One can see this to be true because of the similarities of inner city populations – ones of low skills, incomes and various other characteristics. This also indicates something else – a low reservation and overall cheaper labour expenditures due to that. Such thinking can be externalized to any economic unit – usually there will be characteristics which make that unit suitable or unsuitable for kinds of developments: one would invest coffee farming around the equator and into, for example, fishing industry in areas where the geography permits a year-round fishing. Same can be said for specializations/natural resources of a municipality. Porter argues that capitalizing on those advantages with a cluster of industry – specialization - would be economically beneficial for both the founder of the cluster as well as the local population in terms of employment opportunities that match their skills. Porter clearly identifies clustering – the accumulation of related activities in one place - as an important part of development of a location, so it becomes important to see how that plays a part in unemployment policies within any economic unit. The application of cluster thinking can be adapted to other economic units as well: neighbourhoods or municipalities. This can be done within an augmented Porter argument – if Inner cities have their own unique competitive advantages and disadvantages, why can't other economic units? Not only inner cities would exhibit the characteristics that he describes – peripheral municipalities can exhibit low skilled population, as well as an aged one: meaning that just like the populations of inner cities, these populations would exhibit their own competitive advantages and disadvantages. They can also coincide with Porters argumentation as a geographical location of a municipality or neighbourhood may be the inner city or part of it.

Globally, discretionary policies have received mixed response. For example, the subsidization of industries or firms, in the European Union as studies show, is no evidence of effectiveness of grants on ensuring falling unemployment or rising employment. However, in other areas, or on different levels of reference, effects of grants were found to be positive. This was, however, at the expense of productivity. Either ways, one is given reason to suggest that discretionary policies may work (Neumark & Simpson, 2015, pp. 1221-1230).

A study conducted of the US unemployment issues by Partridge and Rickman (1997), was one set to address what factors contribute to unemployment on a state level (as well as that of its major cities). The findings of this paper were peculiar, because one variable did not have the same effect on all states, for example, industry composition (relative shares by type) has been found to have different effects on different states (Partridge & Rickman, 1997).

Izraeli and Murphy (2001) have researched the importance of clustering with the use of a herfindahl index in the United States. They theorized that states with a more diverse industry (lower herfindahl index) would be more capable to combat unemployment. They have also theorized that there is no determination how diversity would impact employment rates within a country. Statistically, they find some support for their hypothesis that rising specialization within a state – shown by a rising herfindahl index – relates to rising unemployment rates (Izraeli & Murphy, 2001).

As shown by the above citations, the topic of industrial composition and its effects towards unemployment is disputed: This disagrees with the Porter-supported clustering of inner cities as a solution to problems of unemployment, arguing that clustering of any economic unit to focus only on what it is good at leaves it vulnerable when the source of their advantage becomes disadvantaged by the economic state of a nation. If there is clustering, some industry must have a sufficiently high share. If so – does that industry having a high share of employment in an area always contribute the same way towards unemployment? These findings pose a question: which industry to encourage for best effecting unemployment – if any? The findings also create an important dimension towards the unemployment debate – are there specific industries which can be encouraged, directly or indirectly to provide the needed reductions in unemployment? I think that, because of the varied results found by Neumark and Simpson (2015), there may be industries to which one can invest in any situation to always receive positive economic, unemployment-reducing effects. This thesis is about viable unemployment combating policies, and since there is contradicting evidence for either case (in some research types of industries have opposing effects towards employment and unemployment), it may be that there are some reasons to account for the growth/deterioration of some industries and the consequences that this may have in different municipalities, over time, on employment.

Education

Both Porter and his critics reveal that inner cities suffer from various issues – be that education or public transport. What can be said from such points? This means that the education/training provided from day 1 to pension matters – lack of options to educate oneself is just as bad as lack of opportunities to get employed. Generally, structural unemployment occurs due to a skill mismatch. As a solution, the government needs to make sure that its population is adapted to the changing environment – so expenditure of education matters in all cases.

How many students a university can educate can depend on how much funding it receives. Overall, a long-term contributor to reduction of unemployment through enhanced skills, and or productivity – that is one of the contributions of the university. There are interesting implications found in literature: proximity to university (sometimes in combination with a science park), contributes positively towards the employment increases as well as unemployment decreases to an area (Neumark & Simpson, 2015, pp. 1221-1230). Furthermore, with regards to education – in a study conducted by Partridge and Rickman (1997), in all cases education – both high school and college was found to be a very strong and statistically significant reducing factor of unemployment. This provides another dimension of research – if in all given cases education is an important contributor, then it means that a variable that encompasses expenditures on education would be one that provides clarity in a research when testing policies of unemployment (Partridge & Rickman, 1997).

Transport

Secondly, transport – every debater in the previous argument somehow points out how disconnected the inner city is. Industry moved out outside of the city, there are various decentralizations due to land price changes where one can find a job. This means that there must be investment into transport education to meet such criteria – the availability of public transport, roads to drive on as well as cars to drive is one of the important things to account for when determining how successful a government policy is. Neumark and Simpson (2015) also discuss infrastructure related policies: logistical and social infrastructure. The former focusses on the indirect accommodating place-based policy and the latter as well attempts to indirectly influence employment/unemployment by providing the "community" with the tools it needs to bolster its own employment. Overall, neither policy has strong or evident effects, yet those are policies that receive large funds. It is important to test them here to see if it remains the case that infrastructural and community spending do not have statistically significant effects (Neumark & Simpson, 2015, pp. 1221-1230). These findings conflict with theorizations of Porter as well as those of his opponents – therefore it is uncertain when public infrastructure can contribute to the economic environment of an economic unit. However – what is more important is that social/community expenditures are also mentioned as a determinant of social regeneration, or, a means to combat unemployment. It would be interesting to see how the theorized community effect plays a role in a standardized economic environment – when comparing different units empirically.

Scope

Overall, as found by Brechling (1967), UK's stabilization policies were ones to be based on total unemployment rather than regional unemployment. Such lack of focus indicates a strong mispronunciation of applied policy as some regions may need more stabilization than others. The stabilization policy itself is one in which government seeks to curtail the excessive, often inflationary rise of demand, or to encourage a slow-down of an existing decrease in aggregate demand for goods and services that with itself brings economic deterioration. Secondly, there is a difference between responsiveness to a stabilization policy depending on the prosperity of the region: a more prosperous region will be more responsive to changes in total unemployment, rather than that in a poorer region. The total unemployment mentioned here is concerned with national unemployment – the amount of people actively seeking working nation-wide and unable to find it. The regional unemployment means the amount of people looking for employment in a region and unable to find it. As mentioned by Brechling – there is a visible disparity between changes in either of those variables. Furthermore, it is found that there is no policy-making interest to provide employment in the prosperous regions – only depressed regions are targeted (Brechling, 1967).

This highlights the final consideration of this thesis: location. Brechling found that analysing national policy is inefficient because it is quite often targeted in a biased manner in a peculiar way: policy makers tend to forget that even prosperous regions have issues with unemployment – the ones which are more sensitive to changes in total unemployment. Hence why, it is inefficient to test for national policy due to the heavy issues concerning the skewed or distorted policies that might be in place. It is therefore preferable to take a smaller unit of account and to see how that unit manages with its own budget rather than with overarching schemes of the national authority.

Conceptual Model

The articles discussed in the Porter Debate and the Known Factors of Unemployment revolved about policies and their success in reducing unemployment or increasing employment, as well as the factors that related to changing size of unemployment and employment in the discussed economic units of analysis. It is good to shortly outline the relation of those concepts, and to show how they will appear in this research.

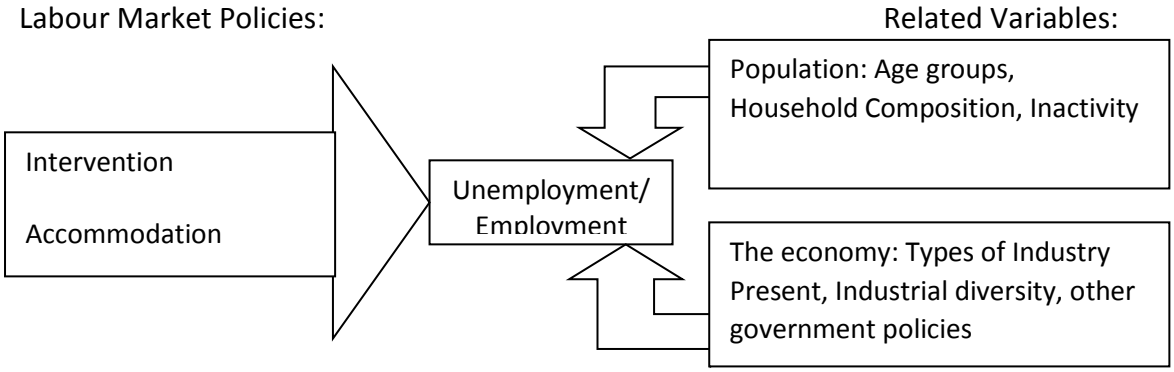


Figure 2

The left-hand side concerns with policy variables: intentionally used policies to raise employment or decrease unemployment. The right-hand side consists of endogenous factors that would affect unemployment/employment on their own. This includes population: a heterogeneous variable: it can be divided into different overlapping parts. It can be divided into age groups: the young may have an advantage against the old in the labour market, locations which have more young people would be ones that suffer less from unemployment. Alternatively, one can account (control) for households – are there many single person households? Are there many households with children – does this de-activate one parent who must take care of the child, lowering employment? This heterogeneity must be addressed by creating models that separate those categories. Secondly, there is also a need to see how the population is employed: which sectors contribute to employing the most, and which contributes to the greatest change in employment. The calibre of effects may change, but these variables are related to the variables of interest: employment (positively) and unemployment (negatively).

Policy Concept:

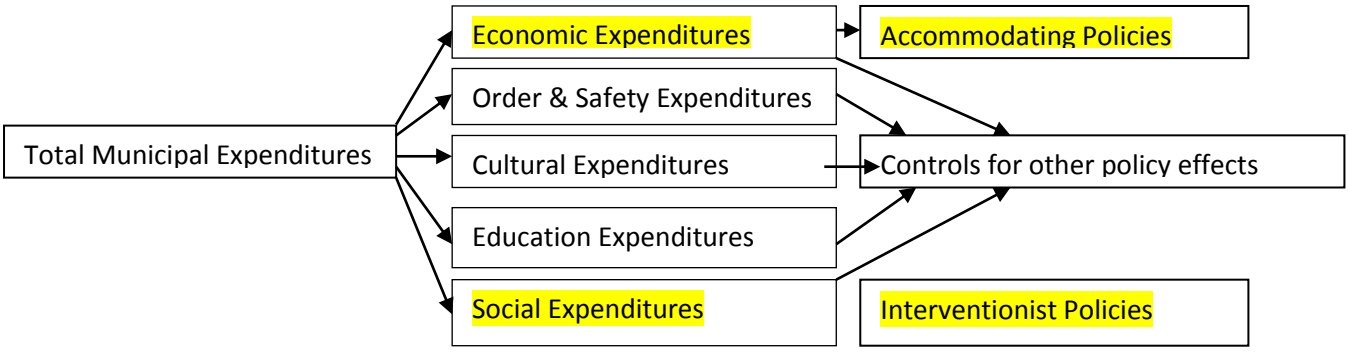


Figure 3

This is the hierarchy of the policy expenditure variables. As can be seen, some sub-categories are not fully expanded – this is, is because there are no direct or indirect policy variables there, however, they are still present due to positive indirect effects they can have upon the employability. These are the policies of interest and ones debated in the literature by Porter and others. The sub-categories that are expanded will be represented by their related variables, without the total values within the regression. The highlighted

text indicates the location of the accommodating/interventionist variables. The remaining expenditures will act as controls. Additionally – there are economic expenditures and social expenditures that are not either accommodating or interventionist policy expenditures, but they may also influence the unemployment and employment. They should be controlled for in the model to avoid overstating the importance of either of the policies of interest: accommodating and interventionist. Controls for policy effects is what is meant in the conceptual model:

Time: It may be necessary to view the effects of policies with a time lag. As Phillips (1957) theorizes that there are time delays through which the response to a change in policy begins to have an effect. This can be due to lack of regulation, poor administration or because there is a natural time delay for the effects to take place. The other issue to consider is the previous patterns of the errors that the policy should correct: how the errors vary over time. He also acknowledges the potential existence of various relationships in a policy study – factors that relate with the policy and the dependent economic variables. The suggestion is to control for any such factors to prevent the bias of the lagged effect (Phillips, 1957). The concept of time must, therefore be accounted for when measuring the effects of economic policies such as increases in economic accommodation and the effects of direct intervention into the labour market.

Table of Effects:

Variable	Effect on Employment	Effect on Unemployment
Accommodating Expenses	Positive, Stronger than direct intervention.	Negative, Stronger than direct intervention.
Intervention Policies In the labour market	Positive, Stronger than accommodating policies.	Negative, Stronger than accommodating policies
Age Group	Varied: Would fall with older aged population due to retirement.	Varied: Would fall with younger population, or would rise with older population due to possible discrimination.
Clustering	Positive effect due to growth in specialization of a location	Dependent on the economic state. May increase unemployment if there is an economic downturn.
Type of industry	Disputed positive effect	Disputed negative effect
Population Density	Significant and Positive Effect	Significant and Negative Effect.
Household composition	Varied effects – Married households would have higher employment.	Varied effects – households with children would be less likely to have unemployment.
Income Security	Disputed effect. Some argue that this decreases willingness to work.	Analysis indicates a small negative effect on unemployment.
Migration Status	Migrants may find it more difficult to find a job due to discrimination. Decreasing the incidence of employment among them.	Migrants may find it more difficult to find a job due to discrimination. Increasing the incidence of unemployment among them.
Education	A better match with the skill demands of the labour market may increase employability of a population	Areas with higher investments into education have been found to have lower unemployment.
Entrepreneurship	Rising entrepreneurship would be a source of both self-employment as well as that of others.	An increased number of entrepreneurs allows for more options for the unemployed to match skills.
Non-Market Effects	Bad reputation to discourage firm location.	Discrimination on the job market.

III. Data

The data gathered is on an aggregated municipal level: a panel database which contains responses from municipalities about their economic and demographic characteristics. Variables such as employment, age distribution, educational level, potential worsening factors such as disability and others, gross domestic product of the relevant area of measurement are included. Finally, policy variables will be represented over time: expenditures or dummy variables as indicators.

Data will be agglomerated from several sources. Demographic variables are found on the CBS – Centraal Bureau van Statistiek – a Dutch statistics website. The data given ranges from the years 2004 to 2016 and concerns with employment status and related variables aggregated for the whole population of a municipality, neighbourhood or city. The variable definitions (in Dutch) can also be downloaded there (Kerncijfers, wijken en buurten, 2017). This will be the core foundation dataset which will then be modified to include policy variables. The next website will be the CBS Statline dataset: it provides in depth information about expenditures on various policies (STATLINE, 2014). These datasets will be merged together in an appropriate manner to provide information. Furthermore, this data will be mended using these datasets from CBS's statline findings: Arbeidsdeelname; regionale indeling 2016, Regional Kerncijfers Nederland, Gemeentebegrotingen; per gemeente, baten en lasten, heffingen 2005-2015. Since the exact link of the data selected for this thesis cannot be copied, these datasets are not provided with hyperlinks. The final source of data, specifically to evaluate different industries as sources of lower unemployment. The LISA database gives the different types of two-digit industries and the employment in each municipality by them. There are 85 industries that relate to the acquisition of resources, manufacturing and services (Landelijk InformatieSystem Arbeidsplaatsenm 1996-2015, EUR/RSM).

On the basis of availability – the cross-sectional analysis and panel analysis will be set the time bracket of 2005 to 2014. The cross-sectional analysis will have all municipalities which had data, including those that may have changed in size – that is because that change wouldn't make a difference for the given years of analysis. The panel regressions will be carried out for 47 municipalities, which have, with certainty, not changed in size in the time of consideration.

The focus of data will be on the municipal level and the scope of the research will be within South Holland. This area contains a large portion of the Randstad area – an area of dense economic activity, however it also contains enough scarcely economic areas which could be used as valid control groups for where policies are less likely to be enacted. This reasoning works because, once put through a statistical model, the relative difference become apparent.

Variable list:

Below are variables that were left after removals of redundant, missing or merged findings from the data sources.

Demographics dataset:

Variable Name	**Variable Definition**
Name	Name of the municipality
Pop	Total population within a municipality at the starting year.
Men	Total male population within a municipality given the starting year. Note – this variable was rounded by CBS to the nearest ten.
Women	Total female population within a municipality given the starting year. Note – this variable was rounded by CBS to the nearest ten.

Pop14	Percentage of population below 14 years of age.
Pop1524	Percentage of population between 15 and 24 years of age.
Pop2544	Percentage of population between 25 and 44 years of age.
Pop4464	Percentage of population between 44 and 64 years of age.
Pop6480	Percentage of population between 65 and 80 years of age.
Pop80plus	Percentage of population above 80 years of age.
Popdens	Population density within 1 square kilometer.
West	Percentage of western migrants.
Nwest	Percentage of non-western migrants from developed countries.
Nwesto	Percentage of non-western migrants not from the previous two groups.
Hh	Number of households rounded to the nearest 10.
hhone	Percentage of households with one individual.
hhnochild	Percentage of households with no children.
hhchild	Percentage of households with children.
hhavgsize	Average size of a houshold.
lowinc	Percentage of population with low income.
highinc	Percentage of population with high income.
inactivepop	Percentage of population which is inactive in the labour market. Inclusive of those who are too disabled to work, students in non-tenured labour, and pensioners.
genbenefits	Total expenditures on general benefits rounded to the nearest 10.
disabben	Total expenditures on disability benefits roudned to the nearest 10.
unemp	Percentage of the labour force that is looking and has no employment.
carstot	Total cars in the municipality
year	Year of observation.

From the demographics dataset, the variable of interest – unemployment rate, will be the dependent variable within this thesis. Other variables of importance here are the name and the year, both of which will be the determining variables within the panel data research part of this paper. All remaining variables will be noted as control variables for the regressions. The next dataset to consider is the municipal expenditures dataset. All variables in this dataset are expenditures per inhabitant on their respective spheres.

Expenditures dataset:

Expenditure name	**Expenditure definition**
totmuni	Total expenditure on all policies by the municipality
totordersafety	Total expenditure on fire prevention, explosive disarmament and security.
admin	Municipal expenditure on bureaucracy.
tottransport	Total expenditures on land and water transport infrastructure.
totecon	Investment into trade and economic accomodation such as fairs, market stalls, industrial subsidies and financial deals to accommodate industry. As well as the supply of electricity and gas to the consumers as well as businesses.
toteduc	Investment into construction of educational infrastructure, for children and adults, as well as staffing expenditures for those facilities

educaccom	Subcategory of education expenditures for tutoring, assistance facilities, scholarships, subsidies for students, supplies for specific classes.
totsoc	Total expenditures on social affairs such as income assistance, unemployment/participation policies, social assistance, child care, disabled facilities and integration of foreigners.
incsec	Subcategory of social expenditures. Income security policy expenditure. Income assistance to the unemployed, partially unemployed, disabled, and other target groups.
empart	Subcategory of social expenditures. Direct intervention policies to encourage employment of people, to raise participation of various parties, such as the disabled.
socwork	Subcategory of social expenditures. Assistance towards childen, the disabled, the elderly, the minorities, and others.
childcare	Subcategory of social expenditures. Government provision of childcare establishments such as kindergardens and daycare.
sochouse	Subcategory of social expenditures. Government provided housing, and or subsidies to providers of housing to the disadvantaged.
totcult	Total expenditures on sports, arts, music, museums, parks.
tothealth	Total expenditures on physical and mental health care. Inclusive of infrastructe and environment protection.
Youth*	Custom-made variable to summarize investments into youth development, youth health and youth centers.

This section gives us the important variables with regards to the Porter debate: about whether direct or intervention policies are more effective. There is an imbalance of variables between direct intervention and accommodating policies that are geared towards cutting down unemployment – there are more designated accommodating policies than those that directly intervene in the market, at least by name.

Firstly, the direct intervention policies. The variable “empart” describes combined employment and participation policy expenditures – these policies are there to re-activate redundant labour force, adult education, various employment schemes, training and retraining that is provided by the government. The second variable to focus on direct intervention is a combination of three variables which were added together: Youth health, youth development and youth centres. These policies, as the name suggest target teenagers who are either at risk of social degradation or simply are looking for employment. Care needs to be taken of this variable as it is a combination variable, meaning that the variations within it are more geared towards encouraging activation – entry into the labour market, rather than exit from unemployment (therefore, already being part of the labour market).

Secondly, the accommodating policies. This section is to include policies which encourage economic activity broadly: trade facilitation, traffic and health infrastructural investments. This also includes the municipalities own investment into the bureaucratic management of its citizens – the variable “admin”. Total economic investment – to encourage market trading (at market stalls), as well as to assist and attract various sectors/firms and developments in cities. The mismatch of skills within labour, both old and the young, is to be solved by the accommodating variable of education investment – it includes all forms of investment into the facilities of education, this variable should contribute to reductions in skill related unemployment. Child care investments – this variable would be one that contributes to the difficulties of

parents finding employment that accommodates for them having a child – they wish to work, but cannot leave their child behind, thus being unemployed voluntarily.

Finally, the last group of variables are there to account for the different types of employment that there is to have in a municipality: the different types of industries. These variables are aggregates of double digit employment codes that are provided by Van Oort (2004). The Aggregation process is described in the appendix.

Industry Variable	**Industry Variable definition**
Acq	Total employment in acquisition of natural resources such as farming, fishing, hunting and forestry output.
Trad	Total employment in the traditional manufactories such as metals, fossil fuels and use of other raw materials
mod	Total employment in the modern manufactories such as printing, electronics and media.
busserv	Total Employment in the business services such as information, finance and design.
Dist	Total employment in the distribution/logistics sectors for services such as public transport, utilities and telecommunications.
oserv	Total employment in other services. This includes trash collection, accommodation, food and beverages, and retail.
speccons	Total employment in special constructions. This is employment in public and or private initiatives to construct such objects as dijks, military infrastructure and others.
govt	Total employment in government-related industries. This includes education, health and security, among others.
totemp	Total employment within the municipality at a given time.
herfindahl	Custom-made herfindahl index that indicates the level of industrial concentration in a municipality.

These variables are alternative ways to view potential unemployment/employment policies: the above described industries are there to see if any grouping of industries allows a one-size-fits-all solution for the government to invest in with a certain, positive outcome on reducing unemployment. Furthermore, it produces the second variable interest – total employment within the municipality.

IV. Method

The variables for policy success tested here will be unemployment and employment. The first is displayed as percentage and the second is given as an absolute number, this is done based on data availability. The nature of the data implies a panel setting: there are multiple municipalities over multiple years. This panel data will be analysed using firstly the fixed effect model – to give a within-municipality effect of the policies and other variables. Ideally, it would also be nice to use the random effects model as it compares the significance between different municipalities. To determine which model is used, firstly a Hausman test will be carried to see the differences between the outputs of both models. If there is no difference, the random effects model will be used. Either model is applicable, however, if possible there is a preference for the random effects model as it would provide lower standard deviations – therefore more clear-cut results. However, before engaging in more complex models, an overview will be given via cross-sectional analysis, at several points in the timespan 2005 to 2014.

Missing Variables and Merges

Missing variable solutions

In some cases, in the dataset, there are variables which are both core – at the top of the previously mentioned hierarchy, as well as having missing observations for specific years. In this case, given the finality of the dataset, the following solution will be applied: Where variables are missing, and in the case that there is only a year missing, the trend of the previous and future year will be assumed: an average will be taken. Although this type of solution is not optimal, it provides variables to work with to test the validity of the overall model. There second case whereby entire municipality observations are missing. This does occur frequently in the CBS dataset, especially for the smaller (in terms of population) municipalities. However, among the CBS “gemeentebegrotingen” datasets, I have found several datasets to merge with my initial 2005-2014 set. These are described already in the datasection. The unemployment variable is retrieved from the workforce participation section – ‘arbeidsdeelname’ part of CBS STATLINE. Others are from a more up to date version of the “gemeentebegrootingen” that was done in 2015 for the previous years.

Variable Merges

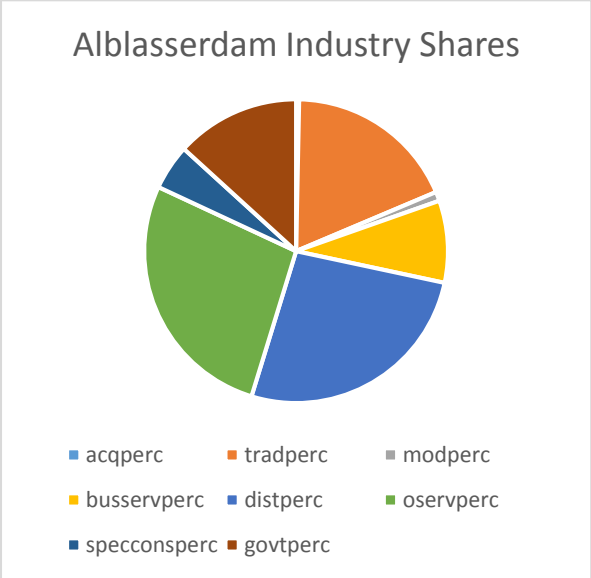
Secondly, upon several other correlation tests, I have found great risks for multicollinearity between all variables: increasing the number of variables within a correlation function, has shown near perfect correlations: positive or negative. The solution for this is to collapse related variables into each other, to create agglomerated data that can then be used a single variable. In some cases, the dataset permits for little effort to be used in this endeavour – there are summed variables that can be used. The chosen categories are based on the expanded version of four-way categorization of industries: Primary (acquisition of resources), Secondary (manufacturing), and Tertiary (services). Primary is reduced in size: only forestry, fishing and agriculture are given the category (A) – acquisition of resources. The second category contains traditional manufacturing (T) – includes mining and oil excavation, as well as long established manufactory such as steel or furniture, and the other category is the modern manufacturing category (M) – anything from 3d printing to electronics and to pharmaceuticals. The third category will contain Business Services (BS) – services which facilitate business related endeavours, and Other Services (OS) – services provided by private parties but not for businesses, rather, independent consumers. The remaining two categories are Government Services (G), such as national defence, health or education, and Distribution/Network Services (D). The full explanation of what variables entered the summary can be found in the appendix. The first group that needs to be reduced in size is that of different industries of employment – there are 85

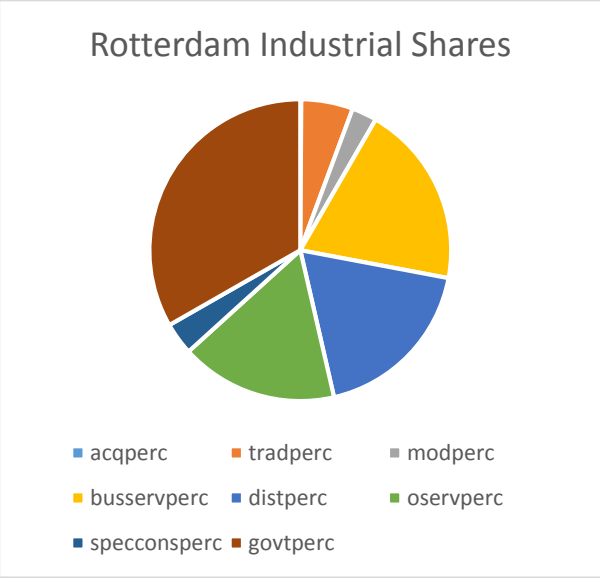
employment variables. The correlation table has indicated that there is quite some relationship between variables – on average the correlation was 60 percent, with quite a few industries having higher. All employment industry variables have been put together based on the given industries.

The other variable merge is one to account for investment into the youth: this variable, as mentioned in the data section contains expenditures on youth development – extracurricular activities, youth centres – places for the young to find help or entertainment, and investments into youth health. This variable is created for two reasons – to see if investments into the young can pay off in lower unemployment rates, and to account for the absence observation in the three separate variables. This also reduces risks of multicollinearity that I expect this will have with social expenditures and healthcare expenditures.

Herfindahl index:

In previous researches, I have also found cause to include a herfindahl index of all industries. Traditionally this variable is used to calculate the concentration between different firms in one industry. Mathematically it is the sum of the squared market shares of different firms within one market. It can also be applied to check whether concentration of one industry in a municipality at a given time is a valid contributor towards reductions in unemployment. Since I had total employment and the summaries of data mentioned previously, I have applied the same method as one would to market shares of firms. The variable of industrial diversity was calculated for all municipalities and all years and will be used in the regression.



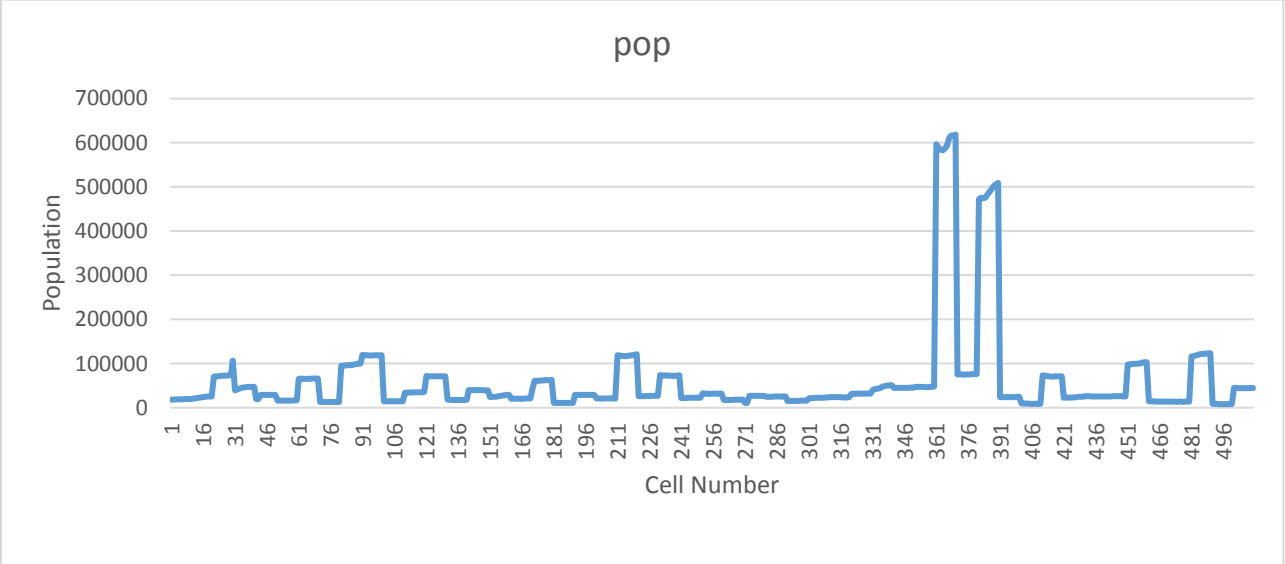


What can be seen from this is that there are different levels of industrial diversity present in different places – Alblasserdam is a large provider of agriculture and other services. Rotterdam provides business and government services. What is interesting is that in Rotterdam, more than a quarter of industry is the government sector. Therefore, it may be important to account for different industrial types present in the municipality.

Finalized dataset

After variable configurations, removals, conversions and other procedures. Issues of normality among variables must be addressed. Firstly, by getting descriptive statistics and normality tests. The full descriptives can be found in the appendix, along with the related variables. The descriptives discussed here will be ones that caused issues for statistical inference and how they were solved.

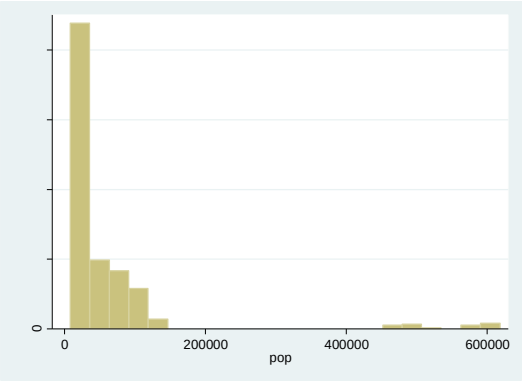
The skewness of variables in this thesis will be measured by the Pearson method – 0 being no skew and anything above or below indicating a skew to the right or left respectively. A skew above 2 or below -2 will be consider an issue for inference and will warrant a solution, first by creating a log, and then by other procedures if necessary. The kurtosis is basically how high the peak data is – in other words if there is an outlier at the peak. The method will again be that of Pearson. The normal value of Kurtosis that is consider a "normal" peak is 3. Anything above or below, depending on how extreme it is, will be solved with a logistic function of the troubled variable. Certain tolerance can be had with kurtosis as the peakedness will not matter when comparing the between variations between municipalities – only one-time period is taken. That is because the comparison is between relative, not absolute variations and so if some municipality peaks higher, it will not be as much an issue as if in the case if the small municipality of Alblasserdam was compared, on absolute terms, with a huge municipality like Rotterdam. In summary – the percentage variables were ones that gave no issues neither in terms of skewness or kurtosis. Problems came with totals variables such as population, and average variables such as the expenditures on policies. The latter case is not necessarily bad as it implies that there is significant variation within the dataset. However, to avoid bias in any case, firstly the variables will have a log function developed using STATA's generate function. Alternatively, they are converted to percentages.



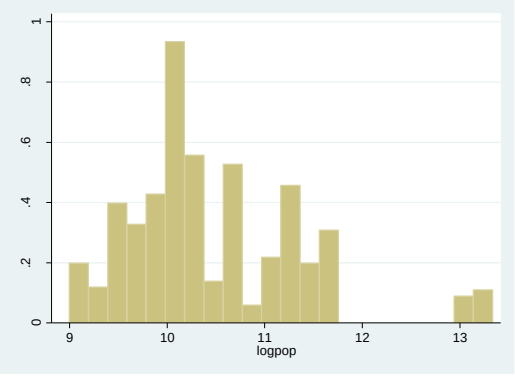
Population graph: overall there are variations, but the spikes are representative of The Hague and Rotterdam – creating high kurtosis and a skewness that needs to be addressed.

As can be seen from the percentage conversions of the industry – the skewness and kurtosis issues become almost non-existent. This is a simple solution that was done on excel by taking the percentages of the total industry. The advantage of this is that this kind of information can be represented quite simply: percentages are easy to understand and to display in a graph. This is one case where creating a logistic function can be avoided. Please note that XLSTAT output is given in general numbers, not fractions or percentages.

Absolute population



Logarithmic function of population



As can be seen from above, a logarithmic function of a variable, especially one that varies as much as population, can induce a variable to behave in mostly a normal distribution – keeping the relative variation to allow for statistical inference. This is applied to variables that have a high skewness and or kurtosis to normalize them. As can be seen by the above outlier near the log number 13, the does not eliminate outliers, but it does reduce the bias that is caused by them very clearly. Upon closer inspection, it turned out that none of the variables followed a normal distribution. This has been mended by making all the variables into logarithmic sequences. The issue was mended, but not solved as there is too much disparity in the data.

Another thing that is to be done to this dataset is to test it for possible multicollinearity issues caused by explanatory variables being correlated with each other as well as the dependent variable. This was done with the STATA's "correl" command. The findings of such tests will be divided based on the three datasets that this thesis relies on:

1. Demographics dataset: Total population correlates heavily with men, women, population density, migrant percentages, household statistics, cars, benefits received. This makes this variable unsuitable to be included if the previously mentioned variables are also included. Same pattern is seen for men and women as well. Pop density is on the verge of being unusable but will be included if the preceding three variables are excluded.
2. Expenditures dataset: The correlations overall are not very high, though some can reach 0.6. No variables will be excluded from the regressions manually – this is left for STATA to determine to remove the least number of variables reducing the greatest amount of multicollinearity risks.
3. Employment/Industry dataset: The correlations are slightly lower than that of the previous dataset. Generally, they do not pass 0.7, indicating that there will be no risks in this dataset of multicollinearity. However, the herfindahl index shows some strong correlations with some variables – I will leave it to STATA to determine if those correlations pose a serious threat towards the integrity of this research.

	totemp	acqperc	tradperc	modperc	busser~c	distperc	oservp~c	specco~c	govtperc	herfin~l
totemp	1.0000									
acqperc	-0.1474	1.0000								
tradperc	-0.1981	-0.0843	1.0000							
modperc	0.1907	-0.2928	-0.0323	1.0000						
busservperc	0.2742	-0.2103	-0.3785	0.1693	1.0000					
distperc	-0.1280	0.0145	0.2728	0.0382	-0.3623	1.0000				
oservperc	-0.2679	0.0908	-0.3413	-0.2255	-0.0667	-0.3028	1.0000			
specconsperc	-0.2416	0.3347	0.2513	-0.2395	-0.3797	0.1504	0.0179	1.0000		
govtperc	0.3007	-0.4217	-0.4419	0.0980	0.1793	-0.6362	-0.0446	-0.4976	1.0000	
herfindahl	0.1601	-0.4276	-0.4756	-0.0810	0.1938	-0.4161	0.0318	-0.5551	0.8482	1.0000

This is an example of how correlation output looks when given by STATA. The other dataset correlations can be added upon request, but are not included due to the sheer size of the graphical representation of such an operation. The variables that are most highly correlated with other variables will be dropped from the research. Some population, gender, and benefit statistics from the demographics dataset are dropped. Out of the household data, only the log of the number of households and the percentage of households with children is left. Car ownership has been removed as well – the mobility explanatory loss will be accounted for by the expenditure variable for transport. Out of income data, high income has been removed, leaving only the low-income percentage. The remaining issue will be with migrants: all three migration variables correlate, not only with each other, but also with the variables next to them. Further variable drops will be left up to STATA.

Cross Sectional Analysis – Effects at a point in time

This method is convenient here, because it allows to keep municipalities which may have changed over time as it only captures and compares the effects of expenditures across different municipalities in the given year. The municipalities will be chosen for two years – first and last years of the dataset: 2005 and 2014. This is done to account for growth in municipalities, especially for the changing relevance of policies between municipalities.

The models used this part of the analysis will be arranged in increasing manner: more and more variables will be added. Firstly, only the most basic model will be created to be parsimonious and to avoid multicollinearity risks. Secondly, a model of unemployment with each different dataset will be created. Thirdly, different variables will be added or removed to create a model with the most explanatory power. Finally – only the significant variables will be left to test their significance against each other.

Another form of cross sectional analysis that may be relevant is the cross-sectional growth analysis. It differs from the usual form of cross sectional regression by having a dependent variable that is a log function of a later observation of, for example, unemployment, divided by the earlier observation of the same variable. This difference is to account for the actual change that has happened rather than the relationship between different moments in the dataset. Same pattern of variable increase will be used in this model. However, the model should now be read as – up to which period are the differences in policies significant when based on the same starting year. The starting year in the case of my models will be 2005. The ending year is 2014.

Reliability tests

Two tests will be used to test the models: skewness test for residuals and the Ramsey reset test. The former will test whether the predictive model is easily externally applicable: if the residuals are skewed, that means the predictive power is not equally distributed, meaning that some municipalities can't be explained as well as others in terms of employment. The latter will focus on whether there is miss-specification issue because of missing non-linear variables.

The fixed effects model – Policy effects over all time of consideration

By construction, the fixed effects model will eliminate unobserved and fixed factors – ones which would not change over time in the data set of consideration. This is especially useful to determine enacted policy effects if they were enacted during the time of consideration – 2005 to 2014. Any other policies that were enacted outside of that period and held through that period would therefore be excluded by the fixed effects model as unobservable, therefore granting light to only the variables that have changed within that time. In terms of the assumptions of regression this is perfect since now, the error term is no longer correlated with the fixed effects regressors and can't be used to create confounders in the dataset. Overall this is known as the within estimator as it concentrates on the internal changes of the variable consideration – in our case – the unemployment within a municipality over different time periods. This will allow one to estimate what happens when one becomes part of a policy over different municipality and times, allowing to estimate the effects of the same policy on employment in the same municipality over time and seeing if the pattern is recurring across different municipality at a statistically significant recurrence. Although the fixed effects model brings certain benefits, it also creates on difficulty: it does not account for fixed factors such a constant policy, meaning that dummy variables that symbolize policies in a municipality will not provide accurate estimates – if any. The solution for this is the use of random effects model, but first – we need to see if we can do so.

The Hausman test

The Hausman test is a function which allows one to determine between the fixed and random effects model. It is conducted in such manner – firstly results are calculated using both methods. Then the Hausman function is used to compare whether the results are statistically different – if they are, this means that there is an inconsistency between the models, the between errors and within errors do differ, so the model that accounts for the difference – Fixed effects – should be used at the expense of not having time invariant variables. However, if there is no statistically significant difference between the results of the models, the Random effects model is preferred as it gives smaller standard errors – pinpointing a clearer effect of a variable. Since the random effects model may still be used within this piece, one needs to describe it.

The random effects model

One should engage in random effects estimations if the time variant errors are not correlated with each explanatory variable in different time periods. That is because, if that is the case, the fixed effects model would knock out the time invariant errors and by so doing, part of the explanatory power of the model. To shine the brightest light upon a model, the random effects would be preferred as it combines both between and within variations of variables – therefore showing how effective is a policy to one municipality and how effective it is over all. This would help answer the question: does one size fit all?

It may be that, due to the findings in the data section, the dataset becomes of multiple levels: there is a level of personal characteristics such as job, income or education, but there also may be regional factors – the unemployment policy may be of a varying scope – it could be regional and it could also be narrower – on a neighbourhood level. Therefore, a situation may arise where a multi-level model of analysis will have to be used.

The regression

Unemployment/employment total =a variable for accommodating policy + a variable for interventionist policy + demographic variables + policy expenditure variables + industrial variables + control variables + error terms

The number of variables present in the model will be added or removed based on historically-known and in-model statistical significance – to be parsimonious, insignificant variables will be removed if their insignificance is tested via the addition or removal of other variables.

V. Results

The results will be structured in the following manner firstly, cross sectional analysis will be carried out. Years 2005 and 2013 will be analysed as cross sections. After another similar model will be created: the cross-sectional growth model. Following this, the fixed effects model and random effects model. The models will be tested with the Hausman test to see whether it is possible to use and interpret the random effects model. In all cases the research will first be carried out using unemployment as the dependent variable, this will be followed using employment as the dependent variable. The summary graphical results for the latter will be found in the appendix and will only be described in text form in the results section. The interpretations will be found in the discussion section.

Cross Sectional Analysis

2005

Basic Model: Unemployment

```
.
```

logunemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0585988	.0268099	2.19	0.034	.0046642	.1125334
logempart	.0767522	.0164113	4.68	0.000	.043737	.1097675
_cons	-3.439363	.0641042	-53.65	0.000	-3.568324	-3.310402

The basic model is one where unemployment is regressed against the two explanatory variables of interest: economic accommodating policies and interventionist policy expenditure. The former is significant as a 5% significance level and contributes positively towards unemployment. The latter is significant at 1% significance level and contributes positively as well.

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
residuals	50	0.9589	0.9385	0.01	0.9957

```
. ovtest

Ramsey RESET test using powers of the fitted values of logunemp
       Ho:  model has no omitted variables
                  F(3, 44) =      5.78
                  Prob > F =      0.0020
```

Although the residuals of this model are not skewed, the model is very certainly miss-specified and there may be quadratic effects present.

Employment:

When the same regression is carried out using employment as the dependent variable, the following results are seen. Accommodating economic expenditures lose any significance and interventionist policies contribute positively to rising employment at a statistically significant manner at 1% significance level. This is in accordance to what was hypothesized in the theoretical framework section of this work. The model

provides less explanatory power, however. The model is neither skewed nor are the misspecification issues as found by the skewness test and the Ramsey test.

Demographics model: Unemployment

logunemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0216285	.0146685	1.47	0.150	-.0081814	.0514384
logempart	-.0177572	.0116176	-1.53	0.136	-.041367	.0058527
logpop1524	-.1259248	.1376715	-0.91	0.367	-.4057069	.1538573
logpop2544	-.2093405	.2777982	-0.75	0.456	-.7738944	.3552133
logpop4564	-.1724011	.2284777	-0.75	0.456	-.6367238	.2919215
logpop6580	-.2490753	.162245	-1.54	0.134	-.5787967	.0806461
logpop80plus	.1916108	.0645479	2.97	0.005	.0604337	.3227879
logpopdens	-.0268381	.0201956	-1.33	0.193	-.0678804	.0142043
logwest	-.0843081	.0612538	-1.38	0.178	-.2087908	.0401746
lognwest	.1634123	.0455131	3.59	0.001	.0709187	.255906
lognwesto	-.0472166	.0539748	-0.87	0.388	-.1569066	.0624734
loghh	.0554953	.0250674	2.21	0.034	.0045522	.1064384
hhchild	.1297716	.4917085	0.26	0.793	-.8695003	1.129043
lowinc	-1.166691	.6388008	-1.83	0.077	-2.46489	.1315082
loginactivepop	.7045915	.1557465	4.52	0.000	.3880765	1.021106
_cons	-2.377484	1.040901	-2.28	0.029	-4.49285	-.2621193

In the demographics model, the variables of interest are compared against demographic variables, such as age groups. At a 1% significance level, municipalities with increased relative share of the over 80 population experience more unemployment. Similarly, and at the same level, increasing proportion of non-western migrants is also seen at municipalities that experience higher unemployment rates. Similarly, inactive population numbers contribute to higher unemployment rates. At a 5% significance level, increasing numbers of households, also is seen in more highly unemployed municipalities. Municipalities are seen to experience lower unemployment if the proportion of lower income population increases there – this is observed at 10% significance level.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         50      0.0113        0.2442        7.00          0.0302

. ovtest

Ramsey RESET test using powers of the fitted values of logunemp
       Ho:  model has no omitted variables
                  F(3, 31) =      2.81
                  Prob > F =      0.0559
```

There is evidence that the residuals of the model are skewed, and that omitted variable bias is not a cause of model miss-specification. Bias comes from distribution-related issues.

Employment:

Although the explanatory power of the model does not change almost at all, the model itself provides few statistically significant variables. The only variables that are relevant towards employment: At 1% significance level, the increasing number of households also contributes to rising employment. At a 5% significance level, municipalities that have a higher relative share of non-western third world migrants are ones which have higher employment. At a 10% significance level, municipalities where there are more people with lower incomes also have more employment. Neither explanatory variable is relevant in this model. The model suffers from skewed residuals, but not from OVB-related miss-specification.

Policy Model: Unemployment

logunemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0087201	.0218652	0.40	0.692	-.0355437	.052984
logempart	.0115453	.0205318	0.56	0.577	-.0300191	.0531098
logtoteduc	.0605298	.0286579	2.11	0.041	.0025149	.1185446
logincsec	.1061932	.0369156	2.88	0.007	.0314615	.180925
logchildcare	.091095	.0315063	2.89	0.006	.0273137	.1548762
logsochouse	-.0084217	.018317	-0.46	0.648	-.0455025	.0286592
logyouth	-.0140666	.0331549	-0.42	0.674	-.0811852	.053052
logtotorder	.2243546	.0645867	3.47	0.001	.0936057	.3551036
logtothealth	.046372	.0589188	0.79	0.436	-.0729029	.1656469
logtotcult	-.0758706	.0703268	-1.08	0.287	-.2182397	.0664985
_cons	-4.86694	.4528622	-10.75	0.000	-5.783712	-3.950169

In this model, policy expenditures are compared as explanatory variables for unemployment. In some cases, like social expenditures, they are expanded to more detailed expenditures. At a 1% level, municipalities which have higher expenditures in law and order, also experience more unemployment. Higher expenditures on income security and child care are also seen as factors of unemployment increase. The model provides a high explanatory power of 80%, its residuals are not skewed and there are omitted variable issues in the model according to the Ramsey reset test.

Employment:

At a 5% significance level income security, child care, and cultural expenditures all contribute positively towards employment. The overall explanatory power of this model is 20% lower for employment than it was for unemployment, however the residuals are not skewed and there is not enough evidence to say that the model has been miss-specified according to the Ramsey reset test.

Industrial model: Unemployment

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logunemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0342796	.0247095	1.39	0.173	-.0157423	.0843014
logempart	.0505954	.0153555	3.29	0.002	.0195097	.081681
logacqperc	-.0187724	.0150138	-1.25	0.219	-.0491662	.0116215
logtradperc	.1028184	.0414321	2.48	0.018	.0189434	.1866933
logmodperc	.0059458	.0248554	0.24	0.812	-.0443714	.056263
logbusservperc	.1878956	.0702294	2.68	0.011	.0457236	.3300676
logdistperc	.1581929	.0712397	2.22	0.032	.0139758	.3024101
logoservperc	.2759804	.0920918	3.00	0.005	.0895503	.4624104
loggovtperc	.357019	.1043162	3.42	0.001	.1458418	.5681961
logherfindahl	.0131671	.2124497	0.06	0.951	-.4169149	.4432491
_cons	-1.44009	.6968419	-2.07	0.046	-2.850772	-.0294072

The industrial model comprises of different industries in South Holland and the employment in them. It can be seen from the results of this model, that at a 1% significance level, the interventionist employment policies contribute positively towards unemployment. At the same level, increased other services employment and larger government employment are seen in municipalities that experience greater unemployment. At a 5% significance level, the increase employment in business services, and in distribution/logistics, and in traditional manufacturing employment is related to increased unemployment in municipalities. The model provides less than 80% of explanatory power, suffers from skewed residuals and omitted variable bias may cause distortions in the specification of this model.

Employment:

Employment is affected, at a 5% significance level, by intervention in the labour market and encouragement to participate – the effect is positive. At a 5% significance level, municipalities that have increased business services employment also experience larger employment. At a 10% statistical significance level, employment in the government sector is found in municipalities with higher overall employment. This model has lower explanatory power than its predecessor – just 61% percent of variation in employment is explained. However, this model is neither skewed nor is there reason to believe that the model is miss-specified in terms of missing variables.

Basic Model: Unemployment

Source	SS	df	MS	Number of obs	=	50
				F(2, 47)	=	33.20
Model	1.19164562	2	.595822808	Prob > F	=	0.0000
Residual	.843394296	47	.017944559	R-squared	=	0.5856
				Adj R-squared	=	0.5679
Total	2.03503991	49	.041531427	Root MSE	=	.13396

.

logunemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0837344	.0194571	4.30	0.000	.0445917	.122877
logempart	.1765482	.0320045	5.52	0.000	.1121635	.2409329
_cons	-3.814976	.1429446	-26.69	0.000	-4.102544	-3.527409

In this basic model, both accommodating and intervening policies are seen to have a statistically significant incremental effect on unemployment at the 1% level of significance. The explanatory power of the model is low as these variables explain a little over half of the variation. However, interestingly, the model's residuals are not skewed and the Ramsey reset test does not detect a miss-specification based on missing variables.

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	Prob>chi2
residuals	50	0.0152	0.4853	5.98	0.0504

```
. ovtest

Ramsey RESET test using powers of the fitted values of logunemp
       Ho:  model has no omitted variables
                  F(3, 44) =      0.85
                  Prob > F =      0.4765
```

Employment:

Like in the previous model, in this model, both policies have a positive, statistically significant effect on employment within a municipality. It is interesting to note that the coefficients for both policies are almost 4 times the size when predicting employment rather than unemployment. This effect is significant at the 1% level. The model has slightly less explanatory power than its counterpart, suffers from skewness and is not miss-specified in terms of missing variables.

Demographics Model: Unemployment

.

logunemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0212062	.0146744	1.45	0.158	-.0086158	.0510282
logempart	-.023763	.0387874	-0.61	0.544	-.1025885	.0550625
logpop1524	-.1836193	.136707	-1.34	0.188	-.4614414	.0942028
logpop2544	-.1321303	.2133525	-0.62	0.540	-.5657147	.3014542
logpop4564	.2872122	.2608896	1.10	0.279	-.2429792	.8174036
logpop6580	-.3213191	.1540308	-2.09	0.045	-.6343473	-.0082909
logpop80plus	.0933783	.0910718	1.03	0.312	-.0917018	.2784584
logpopdens	-.0224853	.0185468	-1.21	0.234	-.060177	.0152064
logwest	-.0623622	.0559656	-1.11	0.273	-.1760981	.0513736
lognwest	.1828346	.0462869	3.95	0.000	.0887683	.276901
lognwesto	-.0080493	.0533694	-0.15	0.881	-.116509	.1004104
loghh	.0156153	.0236215	0.66	0.513	-.0323893	.0636199
hhchild	-.8569086	.4102906	-2.09	0.044	-1.690719	-.0230978
lowinc	.4942837	.606583	0.81	0.421	-.7384412	1.727009
loginactivepop	.2832294	.2041364	1.39	0.174	-.1316257	.6980845
_cons	-2.374588	.991636	-2.39	0.022	-4.389835	-.3593417

At statistical significance level of 1%, non-western migrants contribute positively towards unemployment. At a 5% statistical significance level, the population in the age bracket of 65 to 80 contributes negatively towards unemployment, as do increasing numbers of households with children. The model provides nearly 90% explanatory power; however, its residuals are skewed, and it may be miss-specified because of missing variables.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         50      0.0162        0.3162        6.28          0.0433

. ovtest

Ramsey RESET test using powers of the fitted values of logunemp
       Ho:  model has no omitted variables
                  F(3, 31) =      5.80
                  Prob > F =      0.0029
```

Employment:

At a 10% and at 5% significance levels respectively, accommodating policies and interventionist policies contribute to a rising employment rate. At a 1% significance level, employment rises with the rising number of households. The model provides high explanatory power of just over 90%, the residuals are skewed and the model does not suffer from OVB-related model miss-specification.

Policy model: Unemployment

.

logunemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.01221	.0124689	0.98	0.334	-.0130544	.0374745
logempart	.0059316	.0223851	0.26	0.792	-.0394249	.0512882
logtoteduc	-.0534407	.0401097	-1.33	0.191	-.1347107	.0278292
logincsec	.2852434	.0283375	10.07	0.000	.2278263	.3426606
logchildcare	-.0050088	.0187432	-0.27	0.791	-.042986	.0329684
logsochouse	-.0050077	.0122098	-0.41	0.684	-.0297472	.0197318
logyouth	.0244189	.0253788	0.96	0.342	-.0270034	.0758411
logsocwork	.0057063	.0222984	0.26	0.799	-.0394746	.0508871
logtotorder	.0638517	.0369658	1.73	0.092	-.011048	.1387514
logtotcult	.0236401	.0384762	0.61	0.543	-.0543202	.1016004
logtothealth	.0875957	.0496194	1.77	0.086	-.0129428	.1881342
_cons	-5.029274	.2747228	-18.31	0.000	-5.585915	-4.472632

At a 1% significance level, municipalities of higher income security expenditures, also have higher unemployment. In this model, the only two policies that are significant at a 10% level are order and safety expenditures, and healthcare expenditures – they are both higher in municipalities with higher unemployment rates. The explanatory power in this model is near 90%, there are no skewness issues with its residuals and the model is likely to suffer from OVB-related miss-specification:

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         49      0.0180        0.6593        5.54          0.0628

. ovtest

Ramsey RESET test using powers of the fitted values of logunemp
       Ho:  model has no omitted variables
                  F(3, 34) =      3.85
                  Prob > F =      0.0179
```

Employment:

At a 10% statistical significance level, accommodating policies contribute to increasing employment in the municipalities. At 1% statistical significance level, increased expenditures on income security are seen in municipalities that experience higher employment overall. The model is less explanatory for employment than it is for unemployment by around 20%. There is both a skew in the residuals and omitted variable bias that is affecting the explanatory power of this model. The coefficients of the statistically significant variables are larger than those of the unemployment model.

Industrial model: Unemployment

logunemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0575566	.0216516	2.66	0.011	.0137622	.101351
logempart	.1478196	.0479096	3.09	0.004	.0509133	.244726
logacqperc	-.0137308	.0170584	-0.80	0.426	-.0482346	.020773
logtradperc	-.0066423	.059021	-0.11	0.911	-.1260235	.1127389
logmodperc	-.0130018	.0336403	-0.39	0.701	-.0810458	.0550422
logbusservperc	.1476414	.0746353	1.98	0.055	-.0033227	.2986054
logdistperc	.0653357	.0737524	0.89	0.381	-.0838426	.214514
logoservperc	.1451641	.1121848	1.29	0.203	-.081751	.3720793
loggovtperc	.1571207	.125597	1.25	0.218	-.0969233	.4111646
logherfindahl	-.0308577	.2418634	-0.13	0.899	-.5200726	.4583572
_cons	-2.94331	.9319006	-3.16	0.003	-4.828257	-1.058363

At a 1% significance level, the employment participation interventionist policies contribute positively towards unemployment. At a 5% statistical significance level, accommodating policies contribute to increased unemployment. Increased employment in business services contributes positively towards unemployment at a 10% significance level. The model provides a mediocre level of explanatory power of 65% and does not suffer neither from skewed residuals, nor OVB-related model miss-specification:

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	50	0.1241	0.6506	2.72	0.2572

```
. ovtest

Ramsey RESET test using powers of the fitted values of logunemp
       Ho:  model has no omitted variables
                  F(3, 36) =      2.14
                  Prob > F =      0.1124
```

Employment:

At a 1% significance level, intervention in the labour market contributes positively to raise employment. At a 5% significance level, accommodation of the economy to encourage employment contributes positively to raising employment. At a 5% significance level, increased employment in business services contributes positively towards employment, however both increased traditional manufacturing and other services are contributing negatively towards employment.

Cross Sectional Growth Models

Pre-crisis (2005-2006)

Basic Model: Unemployment

Source	SS	df	MS	Number of obs	=	50
				F(2, 47)	=	6.23
Model	.019826748	2	.009913374	Prob > F	=	0.0040
Residual	.074786489	47	.001591202	R-squared	=	0.2096
				Adj R-squared	=	0.1759
Total	.094613237	49	.001930882	Root MSE	=	.03989

logunempgr~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.0155419	.0065304	-2.38	0.021	-.0286794	-.0024043
logempart	-.0040985	.0039975	-1.03	0.310	-.0121405	.0039434
_cons	-.0941287	.0156147	-6.03	0.000	-.1255414	-.062716

In this group of models, the change in unemployment is taken from 2005 to 2006 – instead of what it is in the year of measurement of other variables. As the results show, accommodating policies, at a 5% significance level contribute negatively towards unemployment, whilst interventionist policies have no found effect. The model has low explanatory power of 20%. As shown in the below graph, the models residuals are not skewed and OVB does not cause specification issues:

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	50	0.1864	0.6345	2.08	0.3541

```
. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 44) =      0.66
                  Prob > F =      0.5834
```

Employment:

Neither policy has been found to have a statistically significant effect. The model is of very low explanatory power, however without skewed residuals and with no detected ovb specification issues.

Demographics Model: Unemployment

.

logunempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.015214	.0069607	-2.19	0.036	-.0293599	-.0010681
logempart	.0058841	.005513	1.07	0.293	-.0053196	.0170878
logpop1524	-.0038162	.06533	-0.06	0.954	-.1365827	.1289503
logpop2544	.0776923	.131825	0.59	0.560	-.1902085	.345593
logpop4564	.0807667	.1084208	0.74	0.461	-.1395708	.3011042
logpop6580	.1378848	.076991	1.79	0.082	-.0185796	.2943493
logpop80plus	-.0354023	.0306303	-1.16	0.256	-.0976505	.0268459
logpopdens	-.0043675	.0095835	-0.46	0.651	-.0238436	.0151085
logwest	.003207	.0290671	0.11	0.913	-.0558644	.0622784
lognwest	-.0328607	.0215976	-1.52	0.137	-.0767522	.0110308
lognwesto	.0412515	.0256129	1.61	0.117	-.0108002	.0933033
loghh	.0101409	.0118954	0.85	0.400	-.0140334	.0343152
hhchild	-.1014085	.233333	-0.43	0.667	-.5755983	.3727813
lowinc	.4089305	.3031335	1.35	0.186	-.2071109	1.024972
loginactivepop	-.1641276	.0739072	-2.22	0.033	-.3143251	-.0139301
_cons	-.1360511	.4939443	-0.28	0.785	-1.139867	.8677644

Accommodating policies have a negative effect on unemployment growth, at a 5% significance level. Also at a 5% significance level, rising inactive population has a negative effect on unemployment growth. At a 10% significance level, increased cohorts of 65 to 80 are seen to raise unemployment in municipalities. The model has low explanatory power of 30%, no skewed residuals and no OVB specification issues.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         50      0.5328        0.8582        0.43         0.8069

. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 31) =      0.72
                  Prob > F =      0.5487
```

Employment:

At 5% significance accommodating policies raise employment. At a 10% significance level, the 45-64 age cohort has a negative effect, western migrants have a positive effect, non-western migrants have a negative effect, and households with children contribute positively towards employment. The model has very low explanatory power, is neither skewed nor plagued by OVB miss-specification.

Policy model: Unemployment

.

logunempgr~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.0143913	.0074586	-1.93	0.061	-.0295039	.0007212
logempart	.0036538	.0070057	0.52	0.605	-.0105411	.0178486
logtoteduc	-.0143001	.009874	-1.45	0.156	-.0343067	.0057064
logincsec	-.020902	.013225	-1.58	0.123	-.0476984	.0058945
logchildcare	-.0149131	.0110267	-1.35	0.184	-.0372553	.0074291
logsochouse	.0009986	.0062361	0.16	0.874	-.0116369	.0136341
logyouth	-.0077294	.0114402	-0.68	0.503	-.0309094	.0154506
logsocwork	-.0085823	.0137339	-0.62	0.536	-.0364097	.0192451
logtotorder	.0200185	.0224629	0.89	0.379	-.0254956	.0655326
logtotcult	.0545525	.0244727	2.23	0.032	.0049662	.1041388
logtothealth	.0040463	.02006	0.20	0.841	-.0365992	.0446918
_cons	-.257907	.1571059	-1.64	0.109	-.5762339	.0604198

At a 10% significance level, municipalities that engaged in relatively higher accommodating policy expenditures see lower unemployment, whilst cultural expenditures contribute to raising unemployment at a 5% significance level. This model has low explanatory power of 20%, has no skew and may suffer accuracy penalties due to OVB:

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         49     0.9063        0.4808        0.52         0.7697

. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 34) =      3.12
                  Prob > F =      0.0385
```

Employment:

This model offers no explanatory power towards employment – all variables are insignificant. All variables are insignificant.

Industrial Model: Unemployment

.

logunempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.0122994	.0068013	-1.81	0.078	-.0260679	.0014691
logempart	-.0007412	.0042266	-0.18	0.862	-.0092975	.0078152
logacqperc	.0075722	.0041326	1.83	0.075	-.0007937	.0159381
logtradperc	-.0201096	.0114042	-1.76	0.086	-.0431962	.002977
logmodperc	.002866	.0068415	0.42	0.678	-.0109838	.0167159
logbusservperc	-.0124592	.0193307	-0.64	0.523	-.0515921	.0266737
logdistperc	-.0268016	.0196088	-1.37	0.180	-.0664974	.0128943
logoservperc	-.0417337	.0253483	-1.65	0.108	-.0930487	.0095812
loggovtperc	-.0211514	.0287131	-0.74	0.466	-.079278	.0369752
logherfindahl	-.0590351	.0584769	-1.01	0.319	-.1774154	.0593452
_cons	-.3842449	.1918061	-2.00	0.052	-.772536	.0040462

As can be seen from the above table, accommodating policies are significant at a 10% significance level and contribute to lowering unemployment. Also at a 10% significance level, growth in the resource acquisition industry relates to rise in unemployment growth, and growth in the traditional manufacturing industry relates to a fall in unemployment growth. The model offers low explanation for its variations: 37%. It suffers neither from skewed residuals nor from OVB miss-specification:

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         49     0.6716        0.0462        4.28          0.1178

. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 35) =      0.09
                  Prob > F =      0.9672
```

Employment:

In this model, no variable is statistically significant, the residuals are skewed, but ovb is not the cause of miss-specification.

Crisis (2009-2010)

Basic Model: Unemployment

Source	SS	df	MS	Number of obs	=	51
				F(2, 48)	=	8.09
Model	.614276069	2	.307138035	Prob > F	=	0.0009
Residual	1.82165203	48	.037951084	R-squared	=	0.2522
				Adj R-squared	=	0.2210
Total	2.4359281	50	.048718562	Root MSE	=	.19481

logunempgr~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.0449072	.0277023	-1.62	0.112	-.1006063	.0107919
logempart	-.1006658	.0380506	-2.65	0.011	-.1771716	-.02416
_cons	.6092014	.1699548	3.58	0.001	.2674844	.9509183

In this basic model, at a 5% significance level, the interventionist policies have a negative effect on unemployment growth: municipalities which invest relatively more into such policies experience lower unemployment growth. The model has a low explanatory power of 22%, however, it does not suffer from skewed residuals or miss-specification related to OVB:

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                      ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         51      0.0204        0.3394        5.91          0.0520

. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 45) =      1.33
                  Prob > F =      0.2763
```

Employment:

This model shows that increased expenditures into interventionist policies are seen in municipalities which have lower employment growth, at a 5% significance level. The explanatory power of this model is very low, it has skewed residuals and no OVB miss-specification.

Demographics Model: Unemployment

.

logunempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0031017	.0314489	0.10	0.922	-.0607429	.0669463
logempart	-.007893	.0649753	-0.12	0.904	-.1397999	.1240139
logpop1524	.2228262	.3196918	0.70	0.490	-.4261827	.8718351
logpop2544	.9271079	.5575253	1.66	0.105	-.2047286	2.058944
logpop4564	.2327497	.5147211	0.45	0.654	-.8121897	1.277689
logpop6580	.6873659	.3659028	1.88	0.069	-.0554563	1.430188
logpop80plus	-.1645436	.1659815	-0.99	0.328	-.501504	.1724169
logpopdens	-.0105108	.0435571	-0.24	0.811	-.0989364	.0779149
logwest	-.0389958	.1319249	-0.30	0.769	-.3068175	.2288259
lognwest	-.0339491	.0990685	-0.34	0.734	-.2350689	.1671706
lognwesto	-.0608374	.1384079	-0.44	0.663	-.3418202	.2201455
loghh	-.0801187	.0560692	-1.43	0.162	-.1939452	.0337078
hhchild	-1.045419	1.149784	-0.91	0.369	-3.379605	1.288767
lowinc	.2364817	1.494468	0.16	0.875	-2.797451	3.270414
loginactivepop	-.3106252	.4923682	-0.63	0.532	-1.310186	.6889354
_cons	3.191962	2.384052	1.34	0.189	-1.647922	8.031845

In this population-based model, neither of the policies is statistically significant. Only municipalities which have had higher share of the 65 to 80 age demographics in 2009 are seen to experience higher unemployment growth at a 10% significance level. The model has a mediocre explanatory power of 40%, is neither skewed nor is it with miss-specification issues caused by OVB.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         51     0.1538        0.9594        2.14          0.3424

. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 32) =      0.27
                  Prob > F =      0.8480
```

Employment:

Like previously, no policy variable is significant here. Municipalities with denser population had lower employment growth at a 5% significance level, and the same effect is seen from increased households at a 1% significance level. Residuals are not skewed and neither are there OVB miss-specification issues with this model.

Policy model: Unemployment

.

logunempgr~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.0277981	.0331214	-0.84	0.406	-.0947925	.0391962
logempart	-.0084517	.0626056	-0.13	0.893	-.1350834	.11818
logtoteduc	.0126421	.0763034	0.17	0.869	-.1416961	.1669803
logchildcare	.0352362	.0589527	0.60	0.553	-.0840069	.1544794
logsochouse	-.0067736	.0269796	-0.25	0.803	-.061345	.0477978
logyouth	.0078735	.0706951	0.11	0.912	-.1351209	.1508679
logtotorder	.1003365	.1190707	0.84	0.405	-.1405066	.3411797
logtotcult	.0523468	.1269704	0.41	0.682	-.204475	.3091686
logincsec	-.102099	.0939989	-1.09	0.284	-.2922297	.0880318
logsocwork	-.1461084	.0763329	-1.91	0.063	-.3005063	.0082895
logtothealth	.0572674	.121455	0.47	0.640	-.1883985	.3029333
_cons	-.0265396	.9074128	-0.03	0.977	-1.861955	1.808876

In this model, changes in policies in 2009 are compared against changes in unemployment from 2009 to 2010. Only social work has a negative effect on unemployment growth at a 10% significance level. The model has low explanatory power, however no skewness or OVB miss-specification:

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         51      0.9773        0.5745        0.32         0.8538

. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 36) =      1.12
                  Prob > F =      0.3541
```

Employment:

This model sees a more statistically significant impact of social to reduce employment growth, with very low explanatory power of the variations, no skew and with OVB-specification issues.

Industrial Model: Unemployment

.

logunempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.0074377	.0351321	-0.21	0.833	-.0784424	.0635669
logempart	-.0905837	.0511615	-1.77	0.084	-.1939849	.0128175
logacqperc	.0078463	.0217134	0.36	0.720	-.036038	.0517307
logtradperc	-.0361523	.0741124	-0.49	0.628	-.1859391	.1136345
logmodperc	.0598592	.0438356	1.37	0.180	-.028736	.1484543
logbusservperc	-.198628	.1210951	-1.64	0.109	-.4433703	.0461143
logdistperc	-.1597002	.1118926	-1.43	0.161	-.3858435	.0664431
logoservperc	-.2513989	.1542709	-1.63	0.111	-.5631921	.0603943
loggovtperc	-.3343016	.1882351	-1.78	0.083	-.7147389	.0461357
logherfindahl	-.0622516	.3221782	-0.19	0.848	-.7133979	.5888947
_cons	-.9819879	1.211672	-0.81	0.422	-3.430868	1.466893

At a 10% significance level, municipalities which have invested into intervening in the labour market in 2009, have seen lower unemployment growth from 2009 to 2010. Similarly, municipalities with a larger employment in the government sector have seen lower unemployment growth. The model explains little variation of the dependent variable, but has no skew or OVB-caused bias.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                      ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         51     0.6419        0.0044        7.40          0.0248

. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 37) =      0.50
                  Prob > F =      0.6871
```

Employment:

None of the variables are significant in this model, it has low explanatory power, is skewed and doesn't have OVB miss-specification.

Post Crisis (2013-2014)

Basic Model: Unemployment

Source	SS	df	MS	Number of obs	=	50
				F(2, 47)	=	1.08
Model	.00357265	2	.001786325	Prob > F	=	0.3470
Residual	.077544554	47	.001649884	R-squared	=	0.0440
				Adj R-squared	=	0.0034
Total	.081117204	49	.001655453	Root MSE	=	.04062

logunempgr~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0029645	.0058998	0.50	0.618	-.0089044	.0148334
logempart	.0116282	.0097045	1.20	0.237	-.0078947	.031151
_cons	-.0430987	.0433439	-0.99	0.325	-.1302954	.044098

In this model, growth rate from 2013 to 2014 is taken with regards to unemployment. It is tested against both theorized policy types – accommodating and interventionist – to find that none of the policies are significant, at least in this setting. The model offers negligible explanatory power, however no skew or OVB related issues concerning the two variables used.

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

				joint	
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
residuals	50	0.0581	0.9171	3.82	0.1480

```
. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 44) =      0.93
                  Prob > F =      0.4332
```

Employment:

Interventionist policies begin having a negative effect for employment growth, at a 5% significance level. Explanatory power remains low, and skewness and OVB are not issues.

Demographics Model: Unemployment

```
.
```

logunempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0024101	.0080435	0.30	0.766	-.0139364	.0187565
logempart	.0012418	.0212607	0.06	0.954	-.0419651	.0444487
logpop1524	.0241629	.0749337	0.32	0.749	-.1281207	.1764466
logpop2544	.1975005	.1169457	1.69	0.100	-.0401618	.4351627
logpop4564	.2754576	.1430024	1.93	0.062	-.0151581	.5660734
logpop6580	-.096221	.0844295	-1.14	0.262	-.2678023	.0753603
logpop80plus	.0206118	.0499195	0.41	0.682	-.0808369	.1220604
logpopdens	-.0117525	.0101661	-1.16	0.256	-.0324125	.0089076
logwest	.1101528	.0306767	3.59	0.001	.0478103	.1724952
lognwest	.0056647	.0253714	0.22	0.825	-.0458962	.0572257
lognwesto	-.0410974	.0292536	-1.40	0.169	-.1005478	.018353
loghh	-.0228456	.0129477	-1.76	0.087	-.0491585	.0034674
hhchild	.3736948	.2248941	1.66	0.106	-.083345	.8307347
lowinc	.3367224	.3324886	1.01	0.318	-.3389756	1.01242
loginactivepop	.130942	.111894	1.17	0.250	-.096454	.3583381
_cons	.9764442	.5435491	1.80	0.081	-.1281804	2.081069

At a 1% significance level, municipalities with a higher proportion of western migrants may experience higher unemployment growth. A rising demographic of 45 to 64s is seen in municipalities of rising unemployment, at a 10% significance level. At the same significance level, the rising number of households relates to a fall in unemployment growth. This model has very low explanatory power of just 17%, no skewness and no OVB issues.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         50     0.5084        0.9302        0.45         0.7968

. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 31) =      0.38
                  Prob > F =      0.7673
```

Employment:

In this model, an increase in the amount of inactive population has a positive effect on employment growth at a 1% significance level, increase in households with children has a positive effect at a 5% significance level, increase in non-western non-third world migrants has a decreasing effect on employment growth, and an increase in the 65 to 80 age cohort is seen (at a 10% significance level), in municipalities with higher employment growth. The model has minimal explanatory power, no skew and no OVB miss-specification.

Policy model: Unemployment

.

logunempgr~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.001306	.008211	0.16	0.874	-.0153309	.017943
logempart	.0208498	.0147409	1.41	0.166	-.0090181	.0507177
logtoteduc	.036395	.0264128	1.38	0.177	-.0171224	.0899124
logincsec	-.0108501	.0186606	-0.58	0.564	-.0486601	.0269599
logsochouse	.0041509	.0080403	0.52	0.609	-.0121404	.0204422
logchildcare	-.0125349	.0123426	-1.02	0.316	-.0375434	.0124736
logyouth	.0041464	.0167123	0.25	0.805	-.0297159	.0380086
logsocwork	-.0148515	.0146838	-1.01	0.318	-.0446037	.0149007
logtotorder	-.0026721	.0243425	-0.11	0.913	-.0519946	.0466504
logtotcult	-.0119875	.0253371	-0.47	0.639	-.0633254	.0393504
logtothealth	.0109049	.0326751	0.33	0.740	-.0553011	.0771109
_cons	-.1350336	.1809088	-0.75	0.460	-.5015896	.2315224

In this model, to test accommodating and interventionist policies and their effect on unemployment growth in 2013-2014, other policy variables are used as controls. However, none of the variables have significance towards the dependent variable. Apart from that, the model also sheds little light on explanation of the variable, has no skew and no OVB issues in specification.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                      ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+---------------------------------------------------------------
   residuals |         49     0.8353        0.2799        1.27         0.5310

. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 34) =      1.15
                  Prob > F =      0.3439
```

Employment:

This model provides more results than its unemployment predecessor: a negative effect of intervention policies is seen at a 10% significance level. However, as one can see (if they look in the appendix of this thesis) increasing expenditures of social housing are seen in municipalities with higher employment growth. There are no skewed residuals or OVB miss-specs.

Industrial model: Unemployment

.

logunempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0065666	.0077774	0.84	0.404	-.0091646	.0222978
logempart	.0292261	.0172094	1.70	0.097	-.0055832	.0640354
logacqperc	.0046421	.0061275	0.76	0.453	-.0077519	.017036
logtradperc	-.0046906	.0212007	-0.22	0.826	-.0475731	.0381918
logmodperc	-.0029409	.0120838	-0.24	0.809	-.0273827	.0215009
logbusservperc	-.0145874	.0268094	-0.54	0.589	-.0688146	.0396398
logdistperc	.0037583	.0264923	0.14	0.888	-.0498274	.057344
logoservperc	.0200138	.0402974	0.50	0.622	-.0614955	.1015231
loggovtperc	-.0243641	.0451152	-0.54	0.592	-.1156182	.06689
logherfindahl	.0333655	.0868788	0.38	0.703	-.1423634	.2090944
_cons	-.1096015	.3347442	-0.33	0.745	-.7866856	.5674826

A slight effect can be seen in this model, of employment participation, towards an increase in unemployment growth of the municipalities. The effect is significant at a 10% significance level. Other than that, the model explains only 11% of the overall variation. There are no skewed residuals and there are no OVB issues.

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	50	0.9236	0.0179	5.40	0.0671

```
. ovtest

Ramsey RESET test using powers of the fitted values of logunempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 36) =      0.52
                  Prob > F =      0.6727
```

Employment:

Here, interventionist policies have a negative effect on employment growth and it is significant at a 10% significance level. Other than that, increase employment in other services, corresponds with decreased employment growth overall, at 5% significance level. The model explains little, has skewed residuals and no OVB miss-specs.

Panel Regression Models

In this part, the panel regression models will be created under the following principles: parsimoniousness and diligence – to account only for those variables that have been previously found to have an effect in theory, or in this piece itself. The models present will exclude the municipalities of Alphen an de Rijn, Binnenmass, Nieuwkoop, and Rotterdam. These municipalities have changed in size over the consideration period of 2005 to 2014, and so cannot be used, for fear of confounding factors, in the regressions.

```
. xtdes

      id:  1, 2, ..., 51                                     n =         47
    year:  2005, 2006, ..., 2014                             T =         10
           Delta(year) = 1 unit
           Span(year)  = 10 periods
           (id*year uniquely identifies each observation)

Distribution of T_i:   min      5%     25%       50%       75%     95%     max
                        10      10      10        10        10      10      10

     Freq.  Percent    Cum.  |  Pattern
 ---------------------------+----------
        47   100.00  100.00  |  1111111111
 ---------------------------+----------
        47   100.00          |  XXXXXXXXXX
```

The identifying variable was created simply by numerating the municipalities. When ID equals 1, the municipality referred to is Alblasserdam, and so on. The time variable according to which the municipalities are arranged are the years. Overall, as one can see from the above graph, the dataset has 47 municipalities (known as the groups). Which are evenly distributed – meaning that each municipality is observed an equal amount of times. In this case – 10 years. The summary statistics for all variables, both logged and unlogged will be found in the appendix section of this thesis. The variables used for the fixed effects regression will be logged, due to the existences of many skewed, kurtosis-affected distributions among the variables.

Unemployment Fixed Effects

```
Fixed-effects (within) regression               Number of obs      =       459
Group variable: id                              Number of groups   =        47

R-sq:                                           Obs per group:
     within  = 0.4954                                         min =         7
     between = 0.6871                                         avg =       9.8
     overall = 0.3211                                         max =        10

                                                F(28,384)          =     13.46
corr(u_i, Xb)  = -0.9942                        Prob > F           =    0.0000
```

logunemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0332397	.0206923	1.61	0.109	-.0074448	.0739241
logempart	-.0468321	.0169238	-2.77	0.006	-.080107	-.0135572
logpop1524	-.2314354	.3203467	-0.72	0.470	-.8612887	.3984179
logpop4564	-1.236799	.4614224	-2.68	0.008	-2.144029	-.3295678
logpopdens	1.00678	.4277544	2.35	0.019	.1657457	1.847814
logwest	.3889444	.1472628	2.64	0.009	.0994021	.6784867
lognwest	.4601222	.0928428	4.96	0.000	.2775784	.642666
lognwesto	.2597306	.0674086	3.85	0.000	.1271945	.3922668
logpop	.1372194	.373056	0.37	0.713	-.5962687	.8707076
loghhchild	-1.040095	.4351467	-2.39	0.017	-1.895664	-.184527
loglowinc	.627446	.4105681	1.53	0.127	-.179797	1.434689
loginactivepop	-.3497752	.1860368	-1.88	0.061	-.7155534	.0160031
logtoteduc	.006383	.033991	0.19	0.851	-.0604488	.0732148
logincsec	.1210151	.0371098	3.26	0.001	.0480512	.1939789
logsocwork	-.0448503	.034693	-1.29	0.197	-.1130624	.0233617
logchildcare	-.0333514	.0321053	-1.04	0.300	-.0964755	.0297728
logsochouse	-.0239886	.0167307	-1.43	0.152	-.0568838	.0089067
logyouth	.0606014	.0221133	2.74	0.006	.0171232	.1040797
logadmin	-.122472	.0468501	-2.61	0.009	-.2145868	-.0303572
logtottransport	.0413374	.0162643	2.54	0.011	.0093593	.0733155
logacqperc	.0664322	.0286189	2.32	0.021	.0101629	.1227015
logtradperc	-.0131928	.0699173	-0.19	0.850	-.1506615	.1242759
logmodperc	.0148597	.0381196	0.39	0.697	-.0600896	.0898091
logbusservperc	-.2195808	.1165824	-1.88	0.060	-.4488007	.009639
logdistperc	-.1460362	.1028189	-1.42	0.156	-.3481946	.0561223
logoservperc	.0120277	.163036	0.07	0.941	-.3085273	.3325828
loggovtperc	.1244793	.1614379	0.77	0.441	-.1929336	.4418922
logherfindahl	.4936102	.3300387	1.50	0.136	-.1552989	1.142519
_cons	-11.25307	4.808772	-2.34	0.020	-20.70789	-1.798253
sigma_u	1.6248057					
sigma_e	.17367284					
rho	.98870393	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(46, 384) = 3.72                     Prob > F = 0.0000
```

Overall, in this model, accommodating policies have no effect over the time of consideration within the municipalities. However, the direct intervention policy of employment participation has a negative effect on unemployment at a 1% significance level. Out of the control variables, at a 1% significance level administrative expenditures and higher numbers of the age group 45 to 64 are seen in municipalities with lower unemployment. However, municipalities which have a higher share of migrants of any kind, higher income security expenditures and higher youth expenditures are ones which also experience higher unemployment. At 5% significance level municipalities where there are more households with children experience lower unemployment, whilst those where there is a higher population density, higher transport investments and more resource acquisition industry, will experience higher unemployment. Finally, at a 10% significance level, municipalities with higher inactive populations experience less unemployment,

same is true for those with higher business service industries. The model provides an average overall explanatory power of 30% of the variation of the dependent variable, and more explanatory power is seen from between variation rather than within. The residuals for this model are skewed, thus impeding its explanatory power, when applied externally.

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	459	0.0029	0.0483	11.51	0.0032

Random effects were also generated, the full results of the random effects can be seen in the appendix. The model itself offered more explanatory power in all aspects and had residuals that are not skewed. However, upon storing both fixed effects and random effects results (estimates store command), and then using the Hausman test (in that order), it became clear that there are systematic differences in the coefficients of both models. This means that the random model effects results cannot be interpreted leaving the fixed effects model as the one from which interpretation will be made in the following section.

```
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(28) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       75.17
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)
```

Employment Fixed Effects:

The same model has been regressed with regards to employment. Accommodating policy expenditure has been seen to have a negative effect on employment, at a 5% significance level. Employment participation policies have been seen to have a positive effect at a 1% statistical significance level. Out of the controls, at a 1% significance level, age group 15 to 24, non-western third world migrants, income security policies, rising other services industry has been seen in municipalities with lower employment. Municipalities that had higher proportion of the age group 45 to 64 and more industrial concentration (higher herfindahl of industries) have also had higher employment. At a 10% statistical significance, the incidence of having children has potentially contributed to a decrease in employment. At the same significance level, rising traditional and modern manufacturing industries are seen in municipalities that have higher employment. The model's residuals are skewed, and explanatory power is slightly higher than its predecessor. However, like its predecessor, this model is one to interpret, because the Hausman test found the random effects estimation to have systematically different coefficients, leading to it being unusable for interpretation.

VI. Discussion

In this section, summarized results will be presented and interpreted. The conclusions on the hypothesis will be drawn at the end, and it will be followed by limitations and suggestions for future research. In the results table, variables will be mentioned twice: firstly, the explanatory variables of interest, the policies, secondly, in the others section will be included all other variables. In both cases there will be either a plus (+) or a minus (-) before each variable indicating whether they contribute positively or negatively towards the dependent variable. After the variable, there will be asterisks: 1 to indicate 10% significance level, 2 to indicate 5%, and 3 to indicate 1%. In the issues section, there will be 3 considerations: skewness, omitted non-linear variable bias-related misspecification, and finally, in the fixed effects section, whether the model qualified for random effects testing. If there is no skewness, ovb-miss-specification or random effects, a "no" will be written. Finally, the models also have explanatory power rankings: from very low (V.Low) which corresponds to below 20%, to very high (V. High) which corresponds to above 90% explanatory power. An x will be seen in a section which should have significant variables in it, but does not. The models will firstly be discussed by group – cross section, cross section growth, and fixed effects – then related to each other. The summary containing only the two variables of interest (accommodating and interventionist policies) will be provided at the end of this section.

Cross Sectional Models

Cross Sectional Models	**Unemployment**		**Employment**	
	2005 U	**2013 U**	**2005 E**	**2013 E**
Basic:				
Accomodating Policies	+**	+***	x	+***
Intervention Policies	+***	+***	+***	+***
Demographics:				
Accomodating Policy Spending	x	x	x	+*
Intervention Policies Spending	x	x	x	+**
65 to 80 Age Bracket %	x	-**	x	x
80+ Age Bracket %	+***	x	x	x
Households	+**	x	+***	+***
Households with Children %	x	-**	x	x
Non Western Migrats %	+***	+***	x	x
Third world country Migrants %	+**	x	x	x
Low-Income Earners %	-*	x	+*	x
Inactive Population%	+***	x	x	x
Policy:				
Accomodating Policies	x	x	x	+*
Intervention Policies	x	x	x	x
Total Education Spending	+**	x	x	x
Income Security Spending	+***	+***	+**	+***
Childcare Spending	+***	x	+**	+***
Order&Safety Spending	+***	+*	x	x
Cultural Spending	x	x	+**	x
Industry (Employment in..):				
Accomodating Policies	x	+**	x	+**
Intervention Policies	+***	+***	+**	+***
Traditional Manufacturing	+**	x	x	-**
Business Services	+**	+*	+**	+**
Distribution/Logistics	+**	x	x	x
Other Services	+**	x	x	-**
Government	+***	x	+*	x
Other Issues:				
Explanatory Power	High	High	High	High
Skewness of Residuals	No	No	No	Yes
Non-Linear OVB	No	Yes	No	No

Cross sections were taken at beginning and near the end of the consideration period. Over the cross-sectional results, several trends can be seen. Firstly, the models provide better explanatory power for the variations of unemployment rather than employment. Secondly, there is a high tendency among explanatory and control variables to always be positively related towards the dependent variable: either unemployment or employment. Sometimes a variable that relates to rising unemployment also relates to rising employment, as can be seen with both interventionist policies and accommodating policies in the basic model across the years. There can be two explanations for that – since both unemployment and employment seem to be rising – either the labour market itself is becoming larger, so some of the variables result in more unemployed and some result in more employer, or, there is something wrong in the time relationship of the variables. After all, policies are created as a response to an issue or to reach a set goal. If the case is the former, it means that a trend can be seen among municipalities, that unemployment policy expenditures are increased as a response to rising unemployment. In this case, the current positive relationships among municipality unemployment and policy expenditure would make sense. Since all the current variables are measured at the year of interest, these cross-sectional models do not account for lagged effects. This may mean that, whilst accommodating and intervention policies are responses to rising unemployment, it may also take time for them to take the desired effect. The following cross-sectional growth models may shed some light.

Cross Sectional Growth Models:

Cross Sectional Growth Models	Unemployment			Employment		
	2006 U	2010 U	2014 U	2006 E	2010 E	2014 E
Basic:						
Accomodating Policies	-**	x	x	x	x	x
Interventionist Policies	x	-*	x	x	-*	-**
Demographics:						
Accomodating Policies	-**	x	x	+**	x	x
Interventionist Policies	x	x	x	x	x	x
45 to 64 Age Bracket %	x	x	+*	-*	x	x
65 to 80 Age Bracket %	+*	+*	x	x	x	+*
Households	x	x	-*	x	-***	
Households with Children %	x	x	x	+*	x	+**
Western Migrants %	x	x	x	+*	x	x
Non-Western Migrants %	x	x	-***	-*	x	-*
Population Density	x	x	x	x	-**	x
Inactive Population %	-**	x	x	x	x	+***
Policy:						
Accomodating Policies	-*	x	x	x	x	x
Interventionist Policies	x	x	x	x	x	x
Cultural Spendin	+**	x	x	x	x	x
Social Work Spending	x	-*	x	x	-**	x
Industry (Employment in..) % :						
Accomodating Policies	-*	x	x	x	x	x
Interventionist Policies	x	-*	+*	x	-*	-*
Acquisition of Resources	+*	x	x	x	x	x
Traditional Manufacturing	-*	x	x	x	x	x
Other Services	x	x	x	x	x	-**
Government	x	-*	x	x	x	x
Other Issues:						
Explanatory Power	Low	Low	V.Low	V.Low	Low	V.Low
Skewness of Residuals	No	No	No	No	Yes	No
Non-Linear OVB	No	No	No	No	No	No

In these models, growth in employment and unemployment is calculated and set into a logarithmic regression in three periods. This is done to see how the relative importance of the unemployment policies

has changed pre-crisis, directly in the aftermath of the crisis, and several years after the global economic crisis of 2007. Now, the variables may make more predicted sense: Accommodating policies, at least in the pre-crisis time (2005-2006) lower unemployment and increase employment. This means that increased government expenditures on encouraging economic activity have the desired effect on the labour market. However, this policy loses significance in the later years as interventionist policy begins to take statistically significant, but only slightly, effect. However, now it seems that the relationship between intervention and the dependent variables is like what was seen in the normal cross section models – higher intervention expenditures relate to higher unemployment or lower employment, though sometimes that is also not the case. Only the 2009-2010 period still shows these expenditures to improve the labour market. The 2013-2014 growth models show the lowest explanatory power. It seems, over time, other variables begin providing explanatory power for unemployment/employment changes. It may be that other variables should be in the equation – changes in the legal system, different policies, to impact the labour market. Overall, the models that use unemployment as the dependent variable, also provide more explained variations with the dependent variable rather than employment.

Fixed Effects Models

Fixed Effects Models	Unemployment	Employment
Variables of Interest:		
Accomodating Policies	x	-**
Intervention Policies	-***	+***
Demographics:		
15 to 24 Age Bracket %	x	-***
45 to 64 Age Bracket %	-***	+***
Population Density	+**	x
Western Migrants %	+***	x
Non-Western Migrants %	+***	x
Third World Migrants %	+***	-***
Households with Children %	-**	-*
Inactive Population %	-*	x
Policy:		
Income Security Spending	+***	-***
Admistrative Spending	-***	x
Transport Spending	+**	x
Industry (Employment in..) % :		
Acquisition of Resources	+**	x
Traditional Manufacturing	x	+*
Modern Manufacturing	x	+*
Business Services	-*	x
Other Services	x	-***
Herfindahl of Industrial Concentration	x	+***
Other Issues:		
Possibility to do Random Effects	No	No
Skewed Residuals	Yes	Yes

The fixed effects models consider the whole data-given time of 2005 to 2014. There are 47 municipalities in those models. 4 were dropped due to having changed in size (and possibly, other characteristics). They are Alphen an den Rijn, Binnenmass, Nieuwkoop, and Rotterdam. They have been dropped from the final model to avoid any confounding done to the explanatory variables. As can be seen from the above table, Interventionist policies have, over time, the desired effect – they reduce unemployment and they increase employment. Accommodating policies have no effect within municipalities over the consideration period for the dependent variable unemployment, and they seem to reduce employment. The reliability of the findings is not entirely what was desired: both models were tested using the Hausman test and in both cases, the use of the random effects model was forbidden due to the existence of systematic differences in

the coefficients. That is regrettable as the random effects model, apart from having more reliable standard errors, also represents a combined reference to both within and between variations. As the current case stands: only the within variation is explained. This is not entirely bad, since policies by municipalities are created for the municipalities and by municipalities themselves. What is tested, are the effects of municipality policy choices and their overall effectiveness in each municipality on reducing unemployment or increasing employment. In all cases, the residuals of both models are skewed. Although the effects of policies are still explained by the models, external application of these models will not be as efficient as it would have been if the residuals were not skewed. That is, because this implies that some municipalities may have either municipality specific effects, or some omitted variable that is a relevant contributor to those municipalities, and the exclusion of said variable forces the residuals to be skewed rather than normally distributed.

Additional Findings and the predictions of Literature

Apart from referring to the findings about the explanatory variables of interest – accommodating and interventionist policies – I would also like to refer to the other variables that were found to be significant.

In literature that I have discussed, population density, was always found to be negatively related with unemployment: less people would be unemployed in population-dense areas. However, based on the results, that is almost never the case – the denser a population of some South Holland area, the more unemployment there is in that area this may be the case, because, although where there are more people there are more jobs (as found by Frenken, Van Oort and Verburg) – there may also be too few jobs per member of population, hence the negative effect on the labour market. Migration, remains to be an issue of mixed review, there was reason to believe, from literature, that immigrants would contribute to increased unemployment, however, from the results of the models tested here, that remains a mixed issue. In the cross-sectional models, both normal and growth versions, migrants from any of the three groups (western, third-world, non-western), would sometimes be seen in municipalities of higher unemployment, and sometimes they would be seen in municipalities of lower unemployment. The fixed effects model, however, strongly believes that all kinds of migration may have a strong detrimental effect on employment and to raise unemployment. It would be difficult to conclude anything without investigating further due to such conflicting findings.

Age group is also an issue of consideration. In the cross-sectional models, different age groups would have different, and inconsistent effects. Especially the 45 to 64 demographics, which would sometimes contribute positively and sometimes negatively towards the labour market outcomes. Literature argued that as one gets older, they are more likely to be unemployed, yet the fixed effects model finds the opposite – a larger share of older-aged workers (45 to 64) is seen in municipalities with lower unemployment, and the opposite is true for the youth (15 to 24) – this is contrary to what Lee and Clemons have found. However, this does conform to the findings of Partridge and Rickman: the older demographic of +65 would contribute towards lower unemployment. The incidence of having children seems to almost always impact the labour market positively: both the cross sectional, cross sectional growth, and fixed effects models find that municipalities with higher share of households with children are also ones that experience both lower unemployment and higher employment – this is once more contrary to literature as Partridge and Rickman find the opposite effect on unemployment: families with children experience more unemployment. The type of industry rarely had a strongly significant effect in any of the models. In each model, different industries were significant: sometimes acquisition (acq) contributed to raising unemployment, sometimes traditional industry worked to fight it – this, just as the findings in literature, remains a challenged topic. Income security expenditures were seen to have an overall detrimental effect on the labour market – municipalities that spent more on income security, may have also been the ones to

suffer from less employment or more unemployment, contrary to the findings of Partridge and Rickman. Alternatively, there is reverse causality: municipalities try to protect their unemployed, and so the municipalities which have more unemployment, would also be the ones which must spend more on income security. This idea, however, may be put into question by the fixed effects model which does account for change overtime and still shows income security to be detrimental. Finally, industrial concentration doesn't seem to have any relevance up to the last fixed effects model: there it is a strong statistically significant positive contributor towards increased employment within municipalities. This may indicate that investing into agglomeration economies, as suggested by Fainstein and Grey, is not a substantial policy to improve labour market outcomes.

Conclusion

In the beginning of this paper, I have made the following hypotheses with regards to the literature that I have read. I will now determine the rejection or non-rejection of these hypotheses.

Hypothesis 1: *Direct intervention policies lower unemployment, ceteris paribus.*

With regards to the first hypothesis, the interventionist policy that was characterized by investment into employment participation programs was found to be a relevant factor in reducing unemployment. The effect was seen both by the cross-sectional growth models during crisis and post-crisis, and by the fixed effects models – there it both reduced unemployment and was seen to be raising employment. Overall, there is sufficient evidence (provided by the cross-sectional growth and panel regression models) to not reject the first hypothesis. However, as mentioned in the growth model section, interventionist policies are seen to have no significant effect on the 2013-2014 growth rates of neither employment nor unemployment. Overall, the policy still had the effect overall, as proven by the fixed effects model, however, will it continue to do so in the future?

Hypothesis 2: *Economic facilitation policies lower unemployment, ceteris paribus.*

The evidence for accommodating policies as effective fighters against unemployment is much less clear and convincing – it either has no statistically significant effect or has an incremental effect on unemployment in most models. Overall, it may have lost its significance as an effective policy of decreasing unemployment. However, even in the time of consideration, the bracket of 2005 to 2006 – where it did have the predicted effect, there is evidence to believe that these policies do influence fighting unemployment. It may be that, due to omitted variable bias, or lack of regard to an existing interaction effects in the crisis and post-crisis periods, this variable has no shown significance. There is insufficient evidence to claim that simply accommodating the market is an effective means to fight unemployment, hence why the second hypothesis must be rejected.

Hypothesis 3: *Economic facilitation policies will reduce unemployment more than direct intervention policies, ceteris paribus.*

The third and final hypothesis was to consider the relative effectiveness of both policies over the time of consideration and in the municipalities of South Holland. However, as can be seen from the results section, there is rarely a time where both interventionist policy and accommodating the labour market have a statistically significant effect at the same time. This makes comparing their effectiveness statistically unreasonable. Paired with the fact that economic accommodation policies may have lost their significance after the economic crisis, it makes sense to reject the third hypothesis: there are not enough testable environments among the models used in this thesis to prove that economic facilitation policies have a stronger effect on fighting unemployment than interventionist policies. However, this may also outline an issue to be answered by future research: In what environment can economic facilitation policies and

interventionist policies be tested successfully, when interested in their comparative effectiveness as beneficiaries of the labour market?

Summary of the Effects of the Policy Variables

Cross Sectional Models	**Unemployment**	**Employment**				
	2005 U	**2013 U**	**2005 E**	**2013 E**		
Basic:						
Accomodating Policies	+**	+***	x	+***		
Intervention Policies	+***	+***	+***	+***		
Demographics:						
Accomodating Policy Spending	x	x	x	+*		
Intervention Policies Spending	x	x	x	+**		
Policy:						
Accomodating Policies	x	x	x	+*		
Intervention Policies	x	x	x	x		
Industry (Employment in..):						
Accomodating Policies	x	+**	x	+**		
Intervention Policies	+***	+***	+**	+***		
Cross Sectional Growth Models	**Unemployment**		**Employment**			
	2006 U	**2010 U**	**2014 U**	**2006 E**	**2010 E**	**2014 E**
Basic:						
Accomodating Policies	-**	x	x	x	x	x
Interventionist Policies	x	-*	x	x	-*	-**
Demographics:						
Accomodating Policies	-**	x	x	+**	x	x
Interventionist Policies	x	x	x	x	x	x
Policy:						
Accomodating Policies	-*	x	x	x	x	x
Interventionist Policies	x	x	x	x	x	x
Industry (Employment in..) % :						
Accomodating Policies	-*	x	x	x	x	x
Interventionist Policies	x	-*	+*	x	-*	-*
Fixed Effects Models	**Unemployment**		**Employment**			
Variables of Interest:						
Accomodating Policies	x		-**			
Intervention Policies	-***		+***			

VII. Limitations

The chapter below mentions potential issues found in literature that need to be overcome for a successful research (Neumark & Simpson, 2015, pp. 1221-1230):

a) Boundaries of Areas: Where does an area end? However, this issue is to be mended specifically by the division of areas in municipalities and or neighbourhoods and only selecting policies that are applicable to those areas. This does not account for spill over effects, however.
b) Selection bias: All policy areas of a policy may exhibit similar characteristics therefore making them susceptible to the effects, positive or negative, of the policy in question. This will not be an issue within this research to a large extent. The only municipalities that are not selected from the given area – South Holland – are ones that have changed in size in the time of consideration. The remaining municipalities are all included regardless of any factors.
c) Multiple policies: what if an area is impacted by several, maybe over-lapping, policies? Since more than one type of policy can be used to impact unemployment in an area – it is highly likely that more than one policy will be in place. This can be an issue considering national or larger region policies, however inside the municipalities themselves, there is a detailed accumulation of different government policies to control for bias. However, what is not controlled for are legislative changes both within and outside of the municipalities. If a labour law is altered in a way that, for example, makes it harder to hire or fire individuals, or to recruit groups of individuals, unemployment of those individuals, or employment of those individuals, would change. Lack of account for this factor within this thesis may bias the results strongly.
d) Displacement effects: what if the jobs were not created but merely shifted? In this case a policy that is encouraging migration of people and business with economic leniencies, such as tax credits, would cause migration of employable labour into an area, but then would deprive another area. To balance this effect, one needs to account for migration in an out of the policy area. If, after a policy, there is a statistically significant effect of migrants towards unemployment: the policy has created displacement along with, but not necessarily, jobs. Furthermore, since employment and unemployment are not mirrored terms – this may suggest the usage of employment as part of the unemployment regression. If unemployment falls with rising employment, this indicates that the policy that was used would be one that both creates jobs and grants jobs to the seekers. This issue is not fully countered in this research as migration data could not be added. This could create overstatements and understatements. However, a second-best alternative is used – population change is controlled for at least inside the municipalities in one form or another.
e) Discretionary policy (grants) effect: Who exactly is affected by the grants? The issue here would be that recipients of a grant would likely be different from the control group – the non-recipients. This must be corrected for in the similar way that accounts for spill overs – similar plants must be used to control for subsidy effects on the plant level. These effects are included and accounted for by both explanatory variables – economic accommodation and economic intervention. However, although there is also reference to different industries that may be subsidized, only the growth of those industries is seen. This means that the underlying factor on why the dependent variables are affected – natural growth or investment – is not visible.

Another grouping of policies is those that are dedicated to a specific location on a more immersive level – specific issues are identified within an area and are catered to by a policy based in that place. There are two broad types of place-based policies: for specific groups of people and those that target an area. They are further split into direct (specifically target the place or group of interest) and indirect (act more as an accommodator of the target place or group of interest). The two existing glasses through which to view the said policies are the spatial mismatch hypothesis: an existence of a cycle of disadvantage for the low

skilled and or minorities, and positive externalities: spill overs through which employment is created by networking (Neumark & Simpson, 2015).

Either one of those factors play a role in the effectiveness in policy determination – some areas, as mentioned before, may be in a cycle of outward migration, because, due to lack investment, the quantity of jobs is either stagnant, or, dwindling. Less people, less investment, less jobs – the cycle is a mimic of a downward descending spiral of bad fortune. Then there is a positive externality: both a godsend to non-policy neighbours and a curse for those who wish to measure the statistical significance of policies. The former case occurs because of positive spill overs of increased consumption – therefore outward demand – of goods and services. The latter case, sadly, occurs because the effects of policies can no longer be truly distinguished, and far worse, the externalities cannot be readily measured.

Among issues that were found by myself with my work are these:

1. Quality of data: Whilst it can be stated with relative certainty that the data found is of the municipalities and is accurately represented, there are, sometimes missing observations. As mentioned in data processing, the small gaps in data are filled in with averages of the previous and next years, to conform to the existing trend of change. This, when done in small quantities, should not impact the accuracy of the results too much, though there is always the possibility that it has done so.
2. Missing variables: Although some variables could be recovered from the several issued versions of the same CBS output, many variables had so few observations across the municipalities of interest, that these variables simply had to be excluded, because creating averages for said data would not lead to proper specification. This creates omitted variable biases in variables about the population and policies, which may bias the explanatory variables either up or down – to under or overstate the actual contribution of direct/indirect policies. This means that more variables need to be gathered by whatever means available. For example: those are for property ownership as suggested by Butler and Blakely & Small. Furthermore – no migratory data was to be found, it was theorised by the previously mentioned authors to also be relevant. Finally, it was difficult to account for existing social issues and those that may or may not relate to race – as argued by the three authors before. The final issue is one related to what is specified in the theoretical framework section: it was not possible to account for socio-demographic issues of race, and economic issues of borrowing/investment – at least with the given dataset. John Sibley Butler believed that race and discrimination played an important role in his area of consideration, the inner city – if that was the case in one part of a city, there is reason to believe it could have been the case on a municipal level as well. Furthermore, the ability to self-develop using credits, as mentioned by Dymski, may also be a relevant determinant of unemployment, especially on a municipality level – since that indicates how much the municipality allows for entrepreneur based growth that can be a regulator of employment in that area. If this is missing, the effects of either of the policies of interest – direct and indirect – may be biased.
3. Availability of years of data: I could only find a bracket of 10 years where data would match entirely between all 3 of my datasets: demographics, policy and industry. The greatest difficulty was caused specifically by the demographics dataset created from Buurt en Kerncijfers from CBS resources. Measurements varied strongly through the years. Some variables were available at dubious intervals – 2004 to 2008, then again in 2010 to 2014. Income data had to be excluded, because the calculation method of income has changed right in the middle of that period. The final, merged dataset was created as a compromise where the most variables would be available. This means that it cannot be seen how the contribution of the direct intervention policies and the market accommodation policies impacted employment/unemployment over time, and makes it harder to

predict if how they are impacting the labour market will continue to be the way these variables contribute to it. The solution to this is may be difficult to find – if data is not available even from the foremost data authority, it may need to be gathered manually. Although it is clear what data may be gathered (from previous literature), the act of gathering itself is a very tedious issue.

4. Data itself: In its most raw format the data is usually skewed and usually also plagued by outliers. Whilst some of these issues can be solved and were solved using logarithms, upon closer inspection, there were still skewedness or kurtosis issues. This means that it will be hard to say how the explanatory variables would behave in a well-balanced dataset. This can be solved either by gathering more data, or by using more advanced methods of standardizing the distributions within existing data.
5. Results – as can be seen from the results section, there were often issues of skewedness of the residuals of all models. This means that, even though a predictive line can be drawn, showing the relationship between the explanatory and dependent variables, each point of observation of the dependent variable stands in an ununiformed manner next to the regressive line: to some observations the existing model offers good explanation, and to some it does not. This creates problems externalizing the findings to other municipalities OR different levels of analysis.
6. Reverse causality – sometimes, especially in the case of the cross sectional simple models, some variables may be caused by unemployment rather than to have caused it. This can be true about both accommodating and intervention policies. Unemployment may be the issue that the increased expenditures on both are trying to solve. Support is found for this idea, when changing from the simple cross-sectional model, to the growth cross sectional model: both policies change sign. This may indicate that the policies work as they are supposed to and reduce unemployment in retrospect, but expenditures are seen to be higher as a response to the rising unemployment at the same year.

In summary, the greatest issues of this piece, in the opinion of the author, are the data. There is too little data available, and the data that is available is either measured in an ununiformed manner, or has missing observations. Since skewness, and therefore predictive power, is an issue, the greatest solution is to gather more data and to process it in such a manner that, at the very least, the distribution would reflect a Gaussian curve.

Time-span:

There is one other potential limitation: The time-span. The amount of time given by available data to look for the effect of the policies is very small. It may be that policies that have long term effects: such as accommodating policies – may be effective, but their effectiveness is seen over a longer time. Considering also, that there was economic turmoil globally because of the crisis, maybe it may have caused the relationships between policy and other variables to change. This means that what once had a positive effect, may have switched to a negative one.

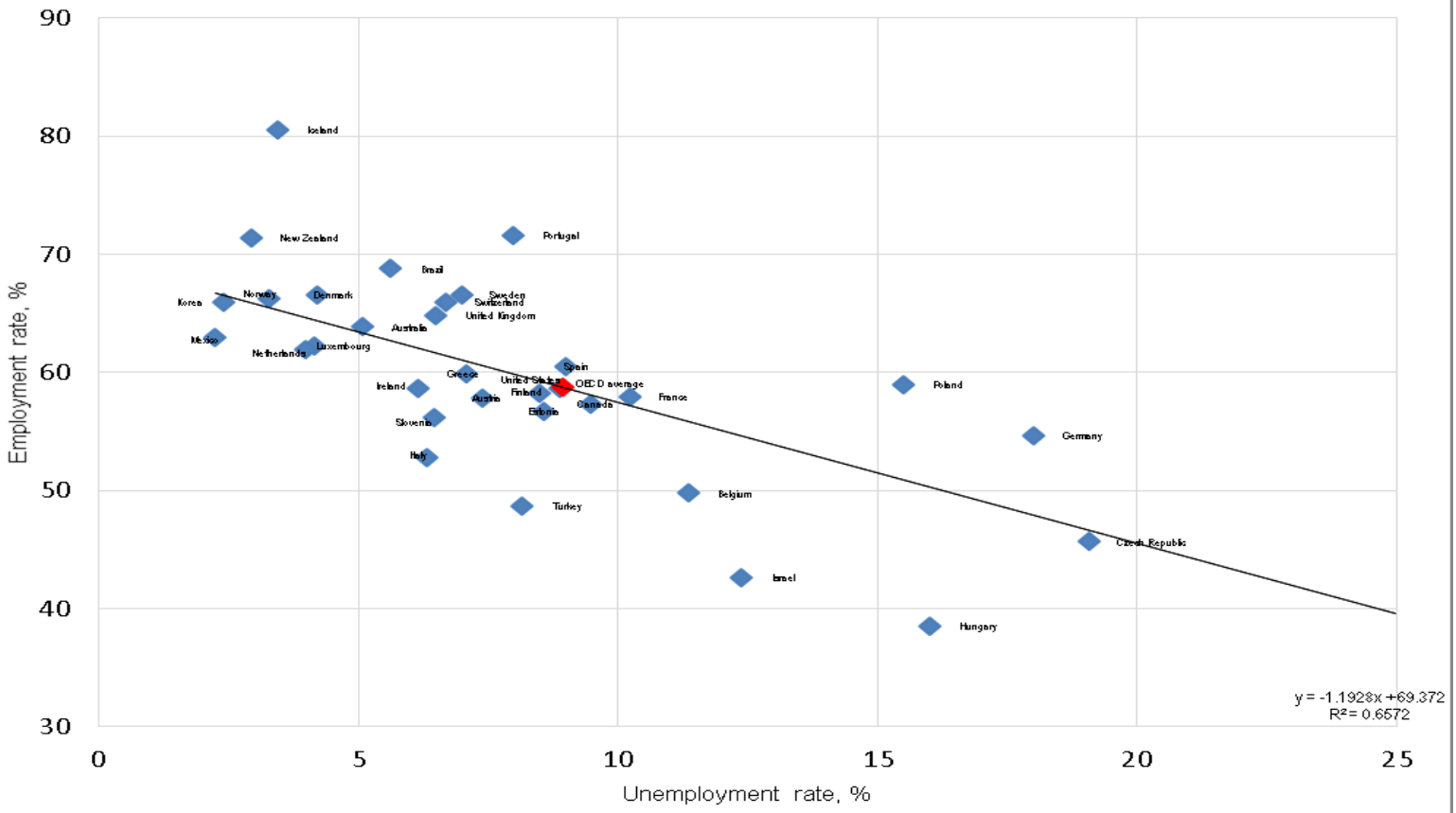
Relation between Employment and Unemployment:

After reading the literature that is described in the Theory part of this thesis, there is one issue: the effects of policies and other variables on both employment and unemployment. Some literature speaks about employment and some about unemployment. Can this pose a problem? That depends on how related those two topics are. In theory, employment is the amount employable population that is employed and unemployment is the amount of population that is looking for a job, but cannot find it. There is an overlap among those terms, because the unemployed are, employable, as they participate in the labour market – they are not classed as inactive. This means that there is some form of relationship between these two variables, but also that they are not perfect opposites of each other.

OECD has released a book, Education at a glance (2009), which discusses this relationship between unemployment and employment. A study is carried out for OECD members internationally, to correlate the unemployment and employment. The findings are such:

As can be seen from the OECD graph, there is a negative relationship between employment and

Chart A6.5. Relationship between employment and unemployment rates for 25-64 year-olds with below upper secondary education (2007)



Note: The Slovak Republic has been excluded from the chart to preserve legibility.

Source: OECD. Table A6.2a and Table A6.4a. See Annex 3 for notes *(www.oecd.org/edu/eag2009)*

unemployment. The correlation coefficient is the square root of the R squared. The correlation is -0.81. The Netherlands is located on the top left corner of the correlation line: its coordinates are around (4% unemployment, and 62% employment. This closeness to the trend line means that the Netherlands exhibits the relationship well (OECD, 2009).

The issue is resolved globally. However, is it applicable to the municipalities of the South Holland Provinces? This can be resolved by correlating these variables on a yearly basis. The variables used below are as they appear when given by the relevant source of data:

2005:

	unemp	totemp
unemp	1.0000	
totemp	0.7484	1.0000

2013:

	unemp	totemp
unemp	1.0000	
totemp	0.7728	1.0000

The correlation between these variables remains high and stable. This outlines an interesting issue: unemployment and employment move in the same direction within South Holland over time. Could this mean that the labour market grows almost proportionately in both employment and unemployment?

However, the causes on why this relationship exists within South Holland is beyond the scope of this thesis, but it may be interesting to investing for future researchers. This may provide explanation on some of the findings where variables contribute in an unexpected manner towards unemployment: When sometimes policies that are there to decrease unemployment, are seen to be raising it. It may be that, since employment and unemployment move in the same direction because of some unforeseen characteristics, policies that would normally reduce unemployment are seen to raise it. This also implicates reverse causality – it's because of rising unemployment that income security expenditures are also rising. Similarly, to the interventionist policies which are seen to be relatively higher in areas of higher unemployment. This is logical because more investment needs to be made to counter higher unemployment. This reverse causality idea can then be expanded towards all variables which have the unexpected, and illogical effect on unemployment.

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IX. Appendix

Data Processing

Concerning the demographic municipal data from CBS: This set of data had different ways of measurement as well as different variables measured across time. The solution was first to rename all variables in a unified manner and to remove variables, such as Housing mobility, which have not occurred frequently enough within the dataset. All this dataset came from separate sheets in the xls format which had to be merged firstly into one dataset before any further processing took place. This was done firstly by importing each excel sheet into STATA for destringing – so that all numeral data was known to the processors as numeral. The next step was to append everything into one file. All variables which were not present in the 2004 dataset have been pushed to the end of the new, unified STATA file. For further editing, this has been exported back into excel. Firstly, not all years can be used: 2016 contains the least amount of data and is likely to be removed from the final results. Secondly, not all Dutch municipalities in South Holland retained their composition throughout the time bracket of interest: this meant that only municipalities that were of the same size throughout this bracket could be used. Referencing was firstly done based on 2016 municipality names to 2004. The municipalities that were left were ones that, at the least, have not changed name due to a merger. A second method was used to ensure the municipalities where consistent over time: all were arranged according to name and year, then ones which had inexplicably large jumps were determined to be municipalities that are not consistent over time. Those were Alphen an den Rijn, Binnenmaas, Katwijk, Nieuwkoop. Leaving 49 municipalities that can be worked with currently. As things stand Alphen an den Rijn, the 5th largest South Holland municipality can be used by excluding the years 2015 and 2016 from the research. Since they contained very little variables, it may be a viable solution. To account for any other abnormalities, a dummy variable will be created for any anomalous year, to localize the distortionary effects of including this municipality in the research.

Concerning the policy expenditure data from CBS: this dataset has been extracted from the archives of CBS. It shows, for a period of 2005 to 2014, policy expenditures within the Netherlands. Broad categories of education and economics have been selected and those recorded both in thousands of euros, as well as per person expenditures. More deliberation on which type of numeral representation to use will be considered in the methodology section. The dataset was adjusted to only include the variables that the demographics dataset would also have. This had left policies, municipality names as well as years. This matched my demographics dataset perfectly, however, the angle of the policy dataset was 90 degrees off what it would need to be to create a panel dataset. The simple solution for this was to use the excel function “transpose” to turn the dataset around the correct way. To merge both datasets, both were sorted according to year and name and the data was simply copied to where it was applicable.

Concerning the merged dataset: Finally, one more step needed to be taken – the cleaning up of the merged dataset. Firstly, the policy variables needed to be translated. The original variable definitions are in the excel output file from STATLINE and can be accessed upon request. The translations for every variable that was not found in the first mentioned data source, come from this output document.

Employment Categorizations – Part 1

00. (Still) unknown / No business activities	unknown	Categories
01. Agriculture, hunting and service for agriculture and hunting	agrihuntemp	A
02. Forestry, forestry and forestry services	forestemp	A
03. Fisheries and breeding of fish and crustaceans	fishemp	A
06. Oil and natural gas extraction	oilgasemp	T
08. Mineral mining (no oil and gas)	mineemp	T
09. Mineral extraction services	mineservemp	T
10. Manufacture of foodstuffs	manufoodemp	T
11. Manufacture of beverages	manudrinkemp	T
12. Manufacture of tobacco products	manutobacemp	T
13. Manufacture of textiles	manutextiemp	T
14. Manufacture of clothing	manuclothemp	T
15. Manufacture of leather, leather goods and shoes	manuleatheremp	T
16. Primary woodworking and manufacture of art. made of wood	manuwoodworkemp	T
17. Manufacture of paper, cardboard and paper and cardboard products	manupaperemp	T
18. Printing, reproduction of recorded media	printemp	M
19. Manufacture of coke oven products and petroleum processing	manucokepetroemp	T
20. Manufacture of chemical products	manuchememp	M
21. Manufacture of pharmaceutical raw materials and products	manupharmarawemp	M
22. Manufacture of rubber and plastic products	manuplasticemp	T
23. Manufacture of other non-metallic mineral products.	manunonmetemp	T
24. Manufacture of metals in primary form	manumetemp	T
25. Manufacture of prod. of metal (no machines and app.)	manuprodmetemp	T
26. Manufacture of computers, electronic and optical power.	manuelectronicsemp	M
27. Manufacture of electrical equipment	manuelectricsemp	M
28. Manufacture of other machinery and equipment	manmachineemp	T
29. Manufacture of cars, trailers and semi-trailers	manucarsemp	T
30. Manufacture of other means of transport	manutransportotheren	T
31. Manufacture of furniture	manufurnitureemp	T
32. Manufacture of other goods	manuothergoodsemp	T
33. Repair and installation of machinery and equipment	repairsinstalemp	T
35. Production, distribution, trade in electricity, natural gas	electricitysupemp	D
36. Winning and distribution of water	watersupemp	D
37. Wastewater collection and treatment	sewageemp	D
38. Waste collection and treatment; preparation for recycling	trashemp	OS
39. Rehabilitation and other waste management	recycleemp	OS
41. General civil and utility building, project development	civiluticonstructemp	OS
42. Soil, water and road construction (no earthquake)	earthworkroadconstru	D
43. Specialized construction work	specconstructemp	C
45. Trade in and repair of cars, motorcycles, trailers	cartraderepemp	D
46. Wholesale and retail mediation (not in cars, etc.)	wholesaleemp	D
47. Retail (not in cars and the like)	retailemp	OS
49. Land transport	landtransportemp	D
50. Water transport	watertransportemp	D

Employment Categorizations – Part 2

51. Aviation	aviationemp	D
52. Storage and service for transport	transpservemp	D
53. Post and couriers	postemp	D
55. Accommodation	accomoemp	OS
56. Food and beverage	fooddrinkemp	OS
58. Publishers	publishemp	M
59. Production and distribution of films and television programs s	filmtvsupplyemp	M
60. Broadcasting and broadcasting of radio and television programs s	broadcastsupemp	M
61. Telecommunications	telecomemp	D
62. Service Loss. activities in the field of information technology.	infotechservemp	BS
63. Service activities in the field of information	infoservemp	BS
64. Financial institutions (no insurance, pension fund)	financemp	BS
65. Insurance and pension funds (no compulsory social security)	insurpensionemp	BS
66. Other financial services	otherfinancemp	BS
68. Rental of and trading in real estate	realestateemp	BS
69. Legal services, accounting, tax advice	legalauditemp	BS
70. Holdings (no financial), internal concert services	holdingsemp	BS
71. Architects, engineers and technical design and advice	archiemp	BS
72. Research and development work	rdemp	BS
73. Advertising and market research	markettingemp	BS
74. Industrial design and design, photography, translation	industrydesignemp	BS
75. Veterinary services	vetemp	OS
77. Rental and leasing of cars, consumer goods, machinery	leaseemp	BS
78. Employment mediation agencies, employment agencies and personnel m	empemp	BS
79. Travel agency, travel agency, tourist information	travelemp	OS
80. Security and detection	securityemp	G
81. Facility management, cleaning and landscaping	maintenancemp	OS
82. Other business services	otherbusinessemp	BS
84. Public administration, public services, social insurance	socservemp	G
85. Education	educemp	G
86. Healthcare	healthemp	G
87. Nursing, care and guidance with overnight stay	nurseemp	G
88. Social services without overnight stay	socservnonightemp	G
90. Art	artemp	G
91. Cultural lending centers, archives, museums, zoos	cultureemp	G
92. Lotteries and gambling	loteremp	G
93. Sports and recreation	sportemp	G
94. Religious and political organizations	religpolitemp	G
95. Repair of computers and consumer goods	repairemp	OS
96. Wellness and other services; funeral industry	wellnessdeathemp	OS
99. Extraterritorial organizations and bodies	extrateritemp	G

- Marked in red are the categories that were excluded due to lack of representation in most municipalities.

Statistic	pop	men	women	pop14	pop1524	pop2544	pop4564	pop6580	pop80plus
Observations	510	510	510	510	510	510	510	510	510
Missing	0	0	0	0	0	0	0	0	0
Min	8075.000	4010.000	4060.000	0.127	0.092	0.173	0.226	0.081	0.021
max	618357.00	304350.00	314005.00	0.240	0.199	0.346	0.336	0.178	0.076
freq min	1	1	1	1	1	1	1	1	2
freq max	1	1	1	1	1	1	1	1	3
Mean	59950.635	29512.225	30438.363	0.180	0.118	0.261	0.281	0.119	0.041
std dev	102869.64	50586.066	52290.164	0.020	0.015	0.029	0.023	0.020	0.010
skew	4.239	4.233	4.244	0.123	1.723	0.128	-0.191	0.399	1.094
Kurtosis	17.896	17.850	17.933	0.303	5.722	0.319	-0.632	-0.525	1.411

Descriptives

Statistic	west	nwest	nwesto	hh	hhone	hhnochild	hhchild	lowinc	highinc
observations	510	510	510	510	510	510	510	510	510
Missing	0	0	0	0	0	0	0	0	0
Min	0.020	0.010	0.010	3080.000	0.210	0.220	0.210	0.290	0.160
max	0.220	0.370	0.110	313295.000	0.560	0.380	0.490	0.456	0.380
freq min	5	13	68	2	8	9	1	4	3
freq max	6	5	3	1	2	2	2	1	2
Mean	0.083	0.094	0.034	27684.333	0.314	0.311	0.375	0.372	0.241
std dev	0.036	0.076	0.022	51923.152	0.076	0.033	0.053	0.031	0.044
skew	1.175	1.616	1.321	4.305	1.126	-0.752	-0.536	-0.351	0.885
kurtosis	2.182	2.857	1.260	18.369	0.969	0.789	0.352	-0.227	0.497

Statistic	genbenefits	disabben	carstot	popdens	unemp	inactivepop	hhavgsize	incsec	empart
observations	510	510	510	510	510	510	510	510	510
missing	0	0	0	0	0	0	0	0	0
min	20.000	290.000	3610.000	139.000	0.026	0.120	1.800	12.000	0.000
max	40280.000	28190.00	216375.00	6216.00	0.126	0.630	2.800	1177.00	838.00
freq min	2	1	1	1	4	1	10	1	1
freq max	1	1	1	1	1	1	3	1	1
Mean	1637.882	2470.765	24174.686	1935.584	0.047	0.180	2.331	223.418	120.495
std dev	5297.826	4559.780	35573.098	1470.779	0.015	0.041	0.206	183.866	131.075
skew	5.267	4.211	3.990	0.764	1.489	3.282	-0.419	1.856	2.408
kurtosis	28.407	17.432	16.172	-0.178	3.099	26.892	-0.079	4.308	6.835

Statistic	totmuni	totordersafety	admin	tottransport	totecon	toteduc	educaccom	totcult	totsoc
observations	510	510	510	510	510	510	510	510	510
missing	0	0	0	0	0	0	0	0	1
min	1057.000	35.000	8.000	0.000	0.000	57.000	14.000	72.000	128.000

max	6505.000	264.000	69.000	676.000	506.000	1224.000	258.000	615.000	2353.000
freq min	1	1	1	2	2	1	2	1	1
freq max	1	1	1	1	1	1	1	1	1
Mean	2610.504	90.856	18.833	33.419	28.175	180.540	58.200	251.013	638.997
std dev	998.720	33.317	7.633	62.232	51.588	126.559	37.276	85.881	408.138
skew	1.342	1.774	3.013	5.577	5.642	3.571	2.372	1.402	1.565
kurtosis	2.462	5.781	12.851	44.037	39.727	19.099	7.083	2.662	2.554

Statistic	socwork	childcare	sochouse	tothealth	youth	herfindahl
observations	510	510	510	510	510	510
missing	0	1	1	0	0	0
min	7.000	0.000	21.000	64.000	0.000	0.152
max	171.000	73.000	3652.000	516.000	128.000	0.449
freq min	1	3	1	2	1	1
freq max	1	1	1	1	1	1
Mean	42.230	14.322	572.467	211.628	27.664	0.217
std dev	31.000	8.551	537.488	56.363	18.448	0.052
skew	1.749	2.821	2.143	1.093	2.925	1.765
kurtosis	3.025	12.860	6.372	5.895	11.458	3.805

Statistic	acq	trad	mod	busserv	dist	oserv	speccons	govt	totemp
observations	510	510	510	510	510	510	510	510	510
missing	0	0	0	0	0	0	0	0	0
min	0.000	46.000	2.000	151.000	222.000	386.000	43.000	257.000	1511.000
max	13320.000	17582.000	9766.000	65430.000	59599.000	54983.000	11663.000	120777.000	327694.000
freq min	2	2	3	1	1	1	1	1	1
freq max	1	1	1	1	1	1	1	1	1
Mean	520.061	1629.506	653.959	4733.559	4460.098	5277.051	963.851	9428.261	27766.316
std dev	1727.032	2552.367	1399.302	10622.274	8690.407	9466.071	1625.654	21898.048	55608.486
skew	6.349	4.596	4.287	4.360	4.914	4.166	4.785	4.241	4.291
kurtosis	40.804	24.688	20.676	19.350	25.955	17.142	25.267	17.335	18.228

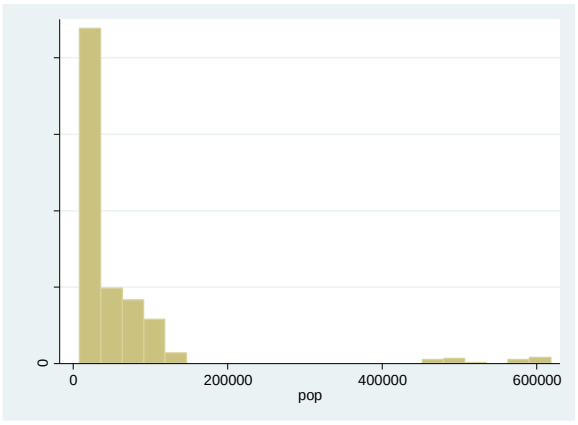
- **Highlighted in Yellow variables that must be accounted for because f their skewness**

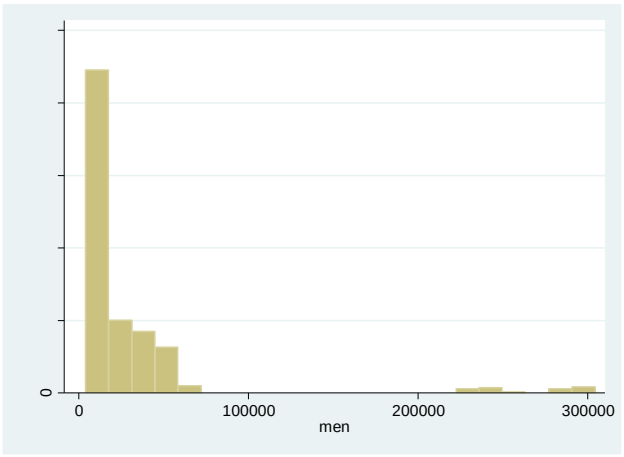
Data Loggings

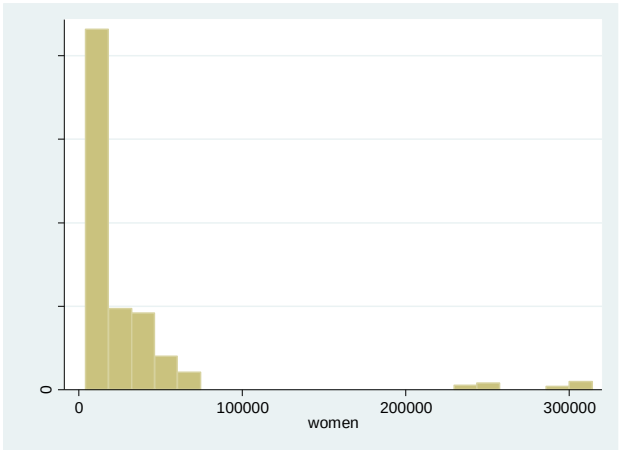
Statistic	logpop	logmen	logwomen	loghh	loggenbenefits	logdisabben	logcarstot	logtoteduc	logeducaccom
observations	510	510	510	510	510	510	510	510	510
missing	0	0	0	0	0	0	0	0	0
min	8.997	8.297	8.309	8.033	2.996	5.670	8.191	4.043	2.639
max	13.335	12.626	12.657	12.655	10.604	10.247	12.285	7.110	5.553
freq min	1	1	1	2	2	1	1	1	2
freq max	1	1	1	1	1	1	1	1	1
Mean	10.464	9.757	9.784	9.609	5.874	7.185	9.648	5.050	3.917
std dev	0.880	0.877	0.883	0.940	1.488	0.961	0.819	0.498	0.515
skew	1.091	1.110	1.073	1.085	0.840	0.975	1.015	0.933	0.583
kurtosis	1.569	1.596	1.541	1.482	0.693	1.138	1.336	1.310	0.417

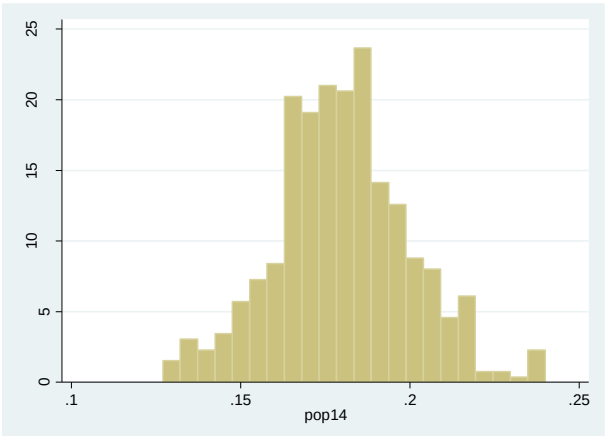
Statistic	loginactivepop	logempart	logadmin	logtottransport	logtotecon	logsochouse	logyouth	logchildcare
observations	510	510	510	510	510	510	510	510
missing	0	1	0	2	2	1	1	4
min	-2.120	0.000	2.079	0.000	0.000	3.045	0.000	0.000
max	-0.462	6.731	4.234	6.516	6.227	8.203	4.852	4.290
freq min	1	7	1	44	6	1	7	2
freq max	1	1	1	1	1	1	1	1
Mean	-1.734	4.266	2.878	2.495	2.673	5.946	3.149	2.528
std dev	0.196	1.167	0.320	1.481	1.079	0.944	0.633	0.546
skew	1.142	-0.969	0.988	0.097	0.376	-0.202	-1.481	-0.697
kurtosis	3.072	1.926	2.532	-0.843	0.375	-0.550	7.910	3.184

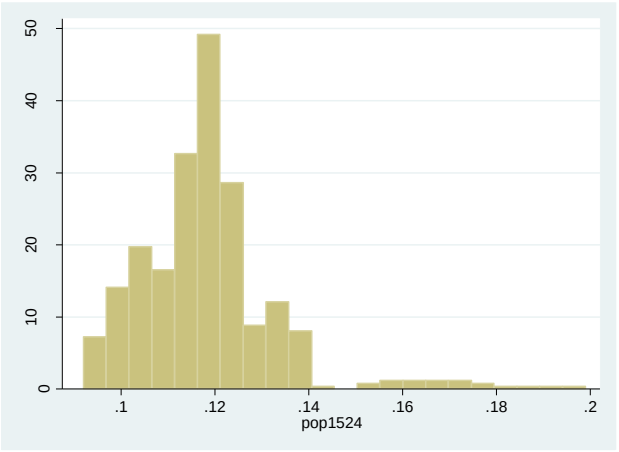
Variable Histograms







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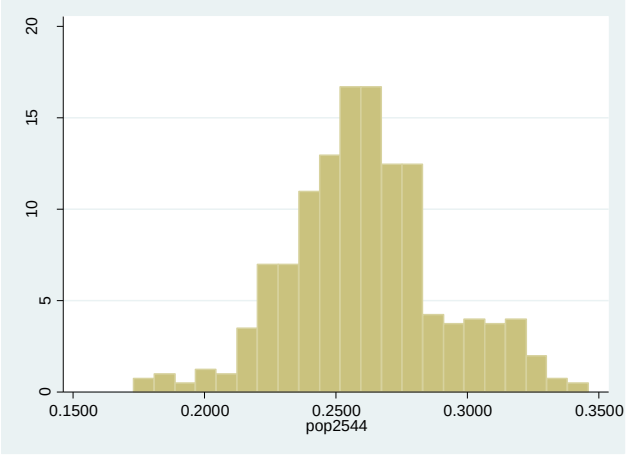
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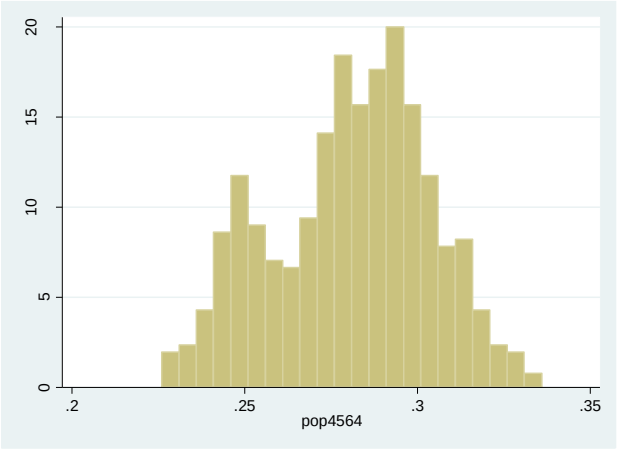
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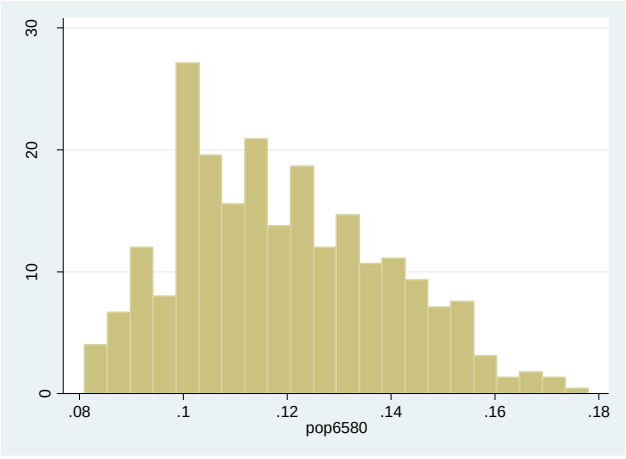
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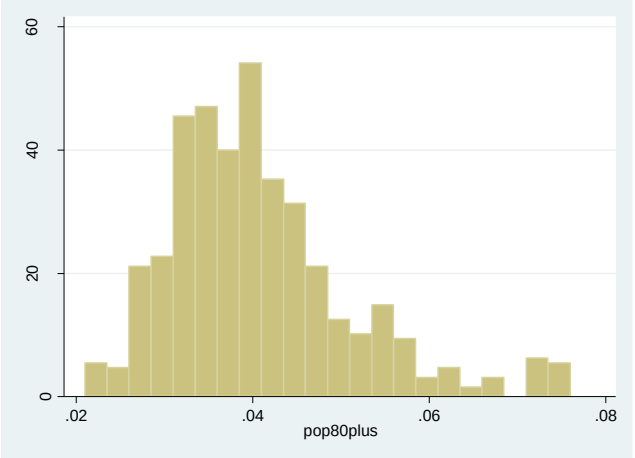
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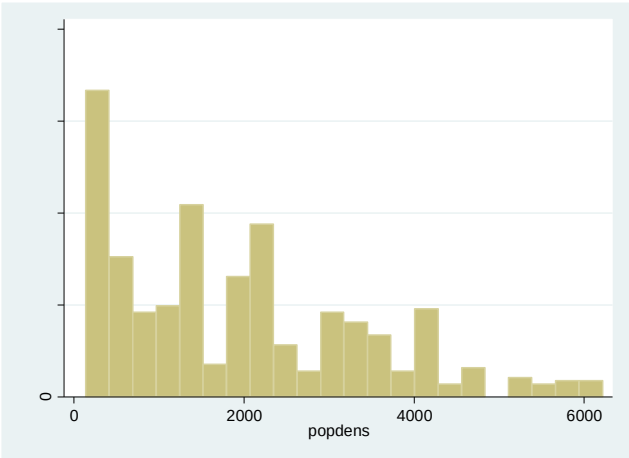
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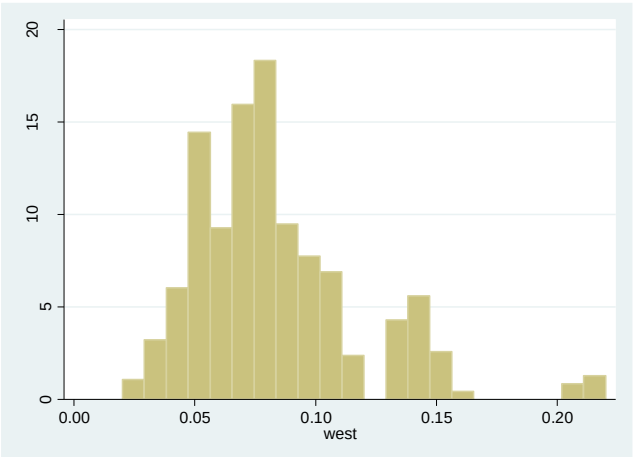
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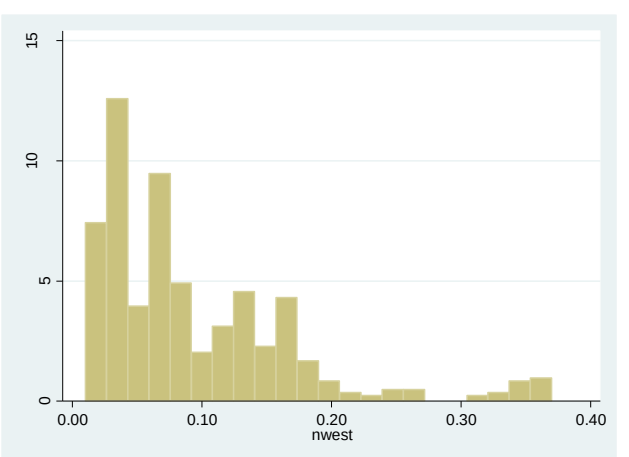
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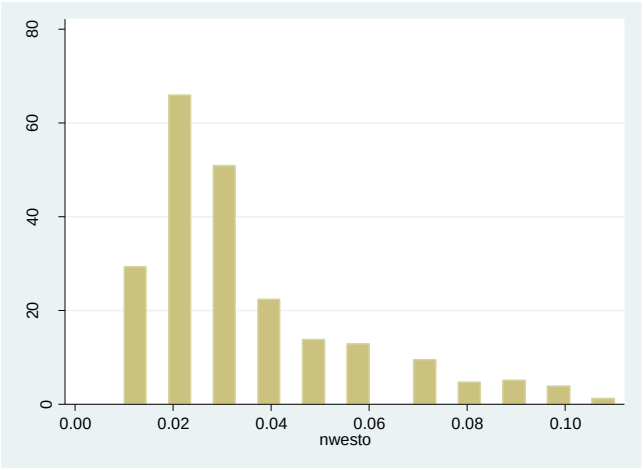
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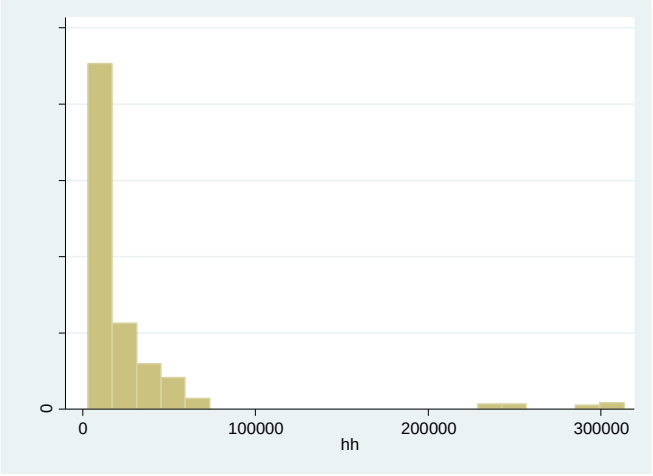
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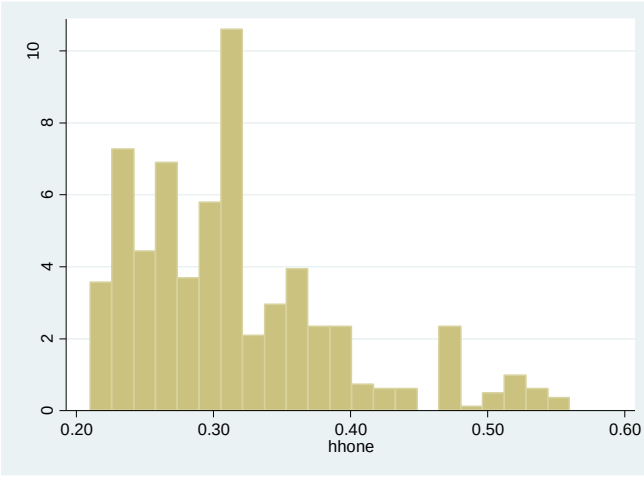
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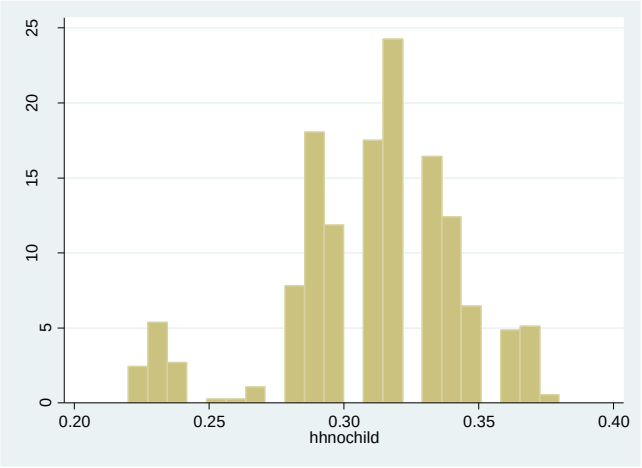
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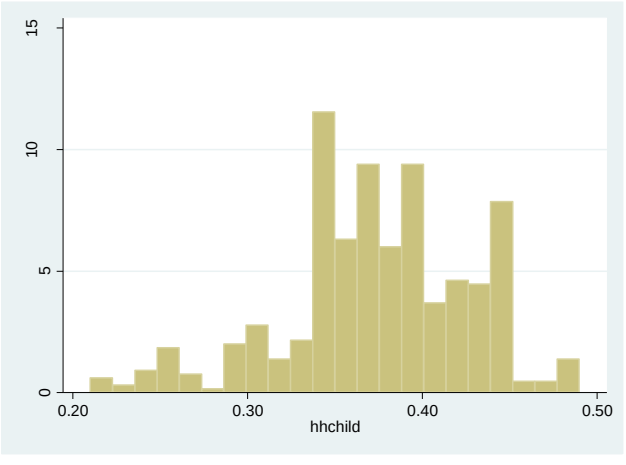
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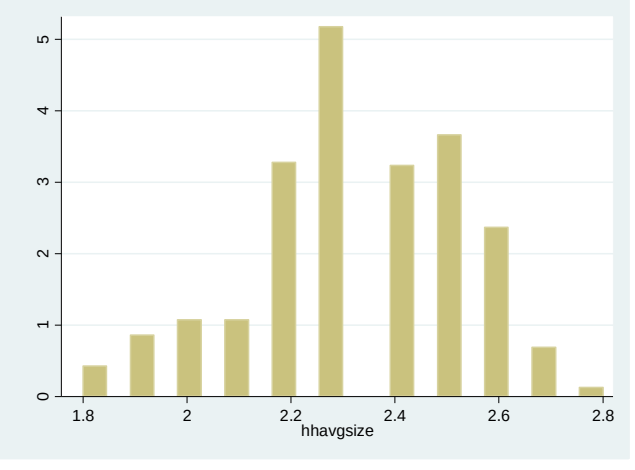
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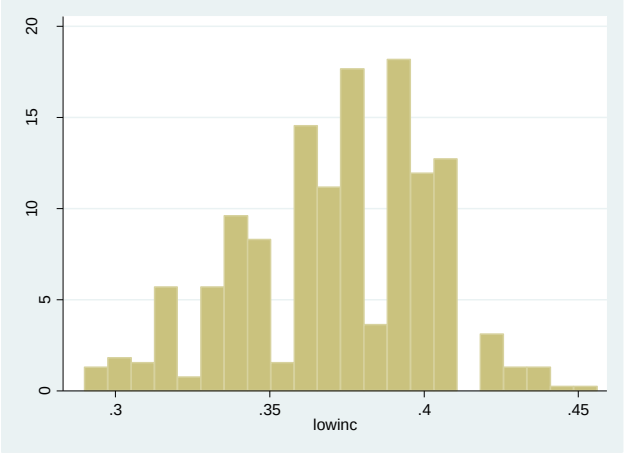
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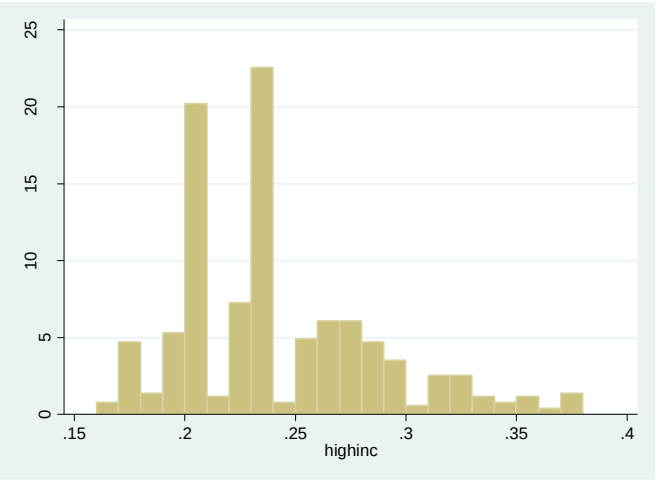
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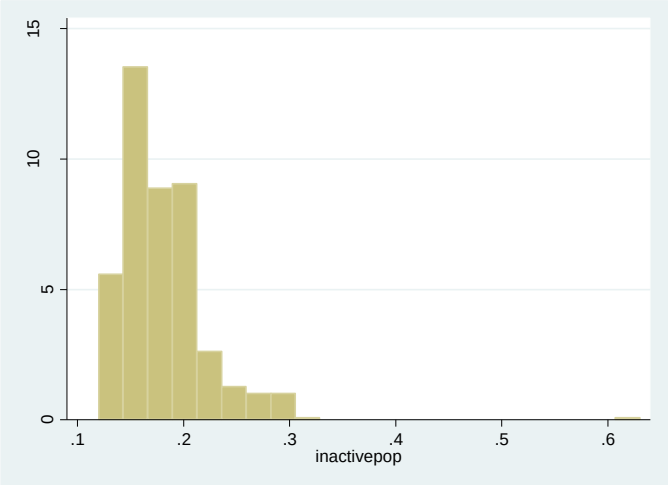
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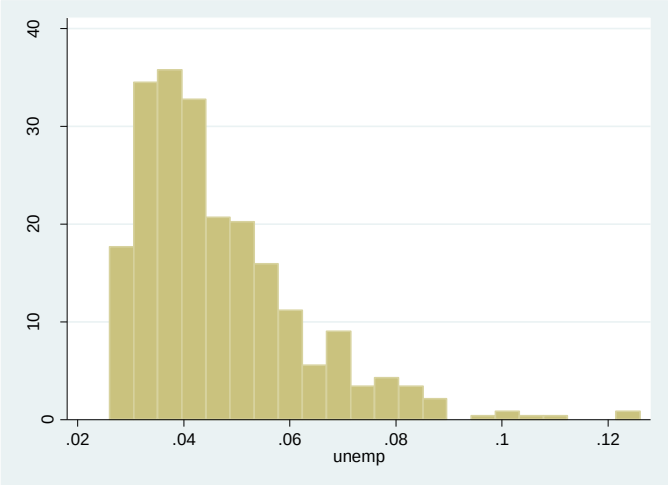
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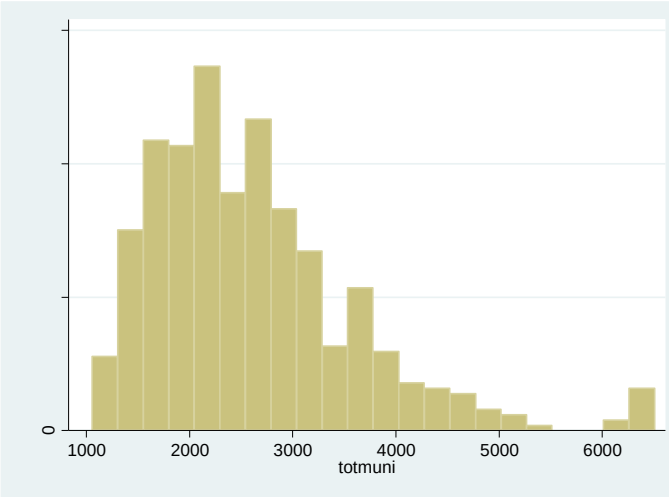
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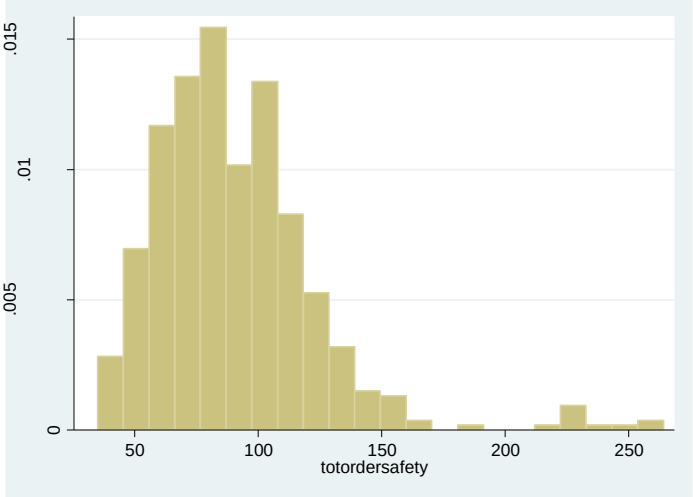
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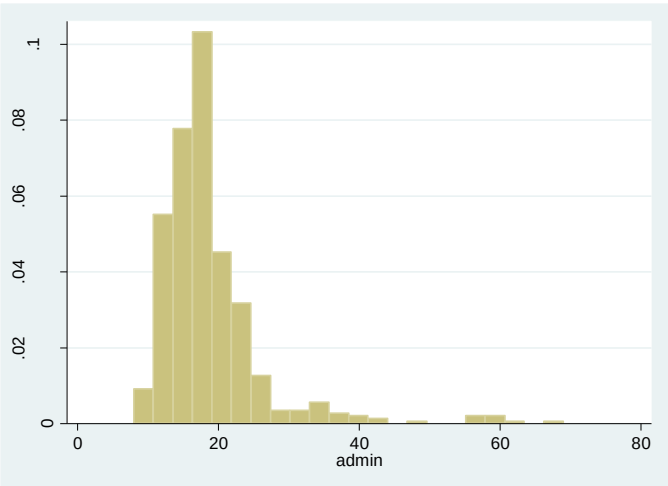
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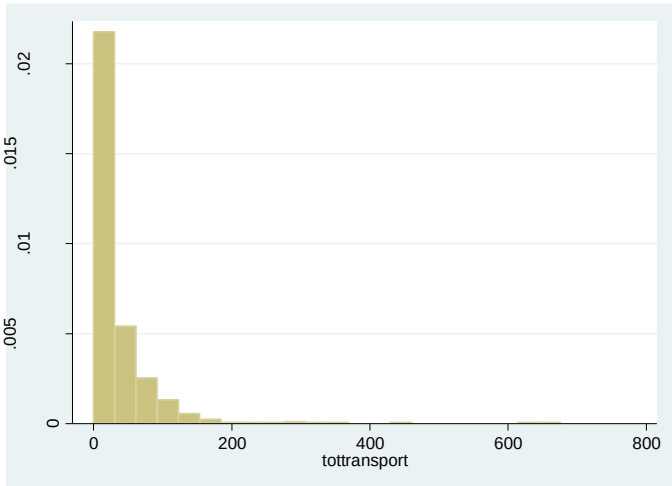
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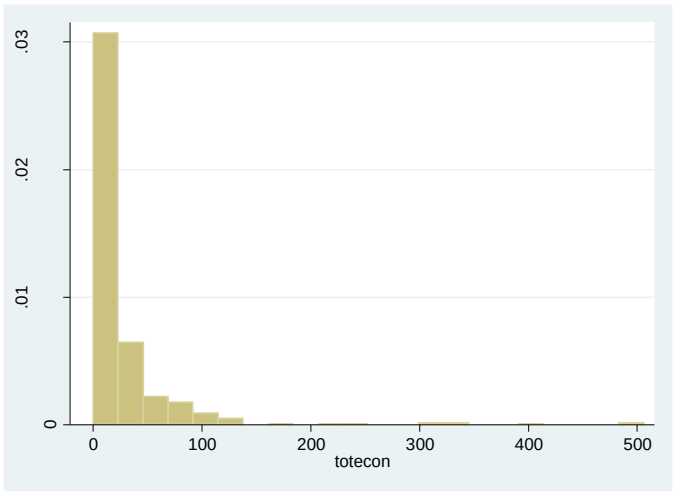
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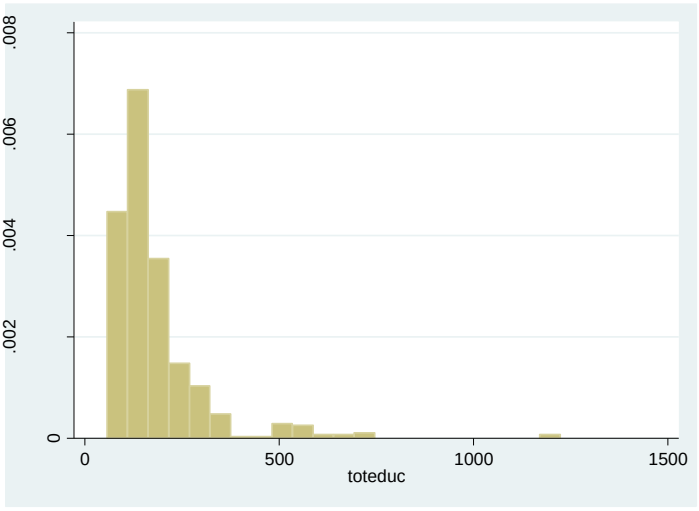
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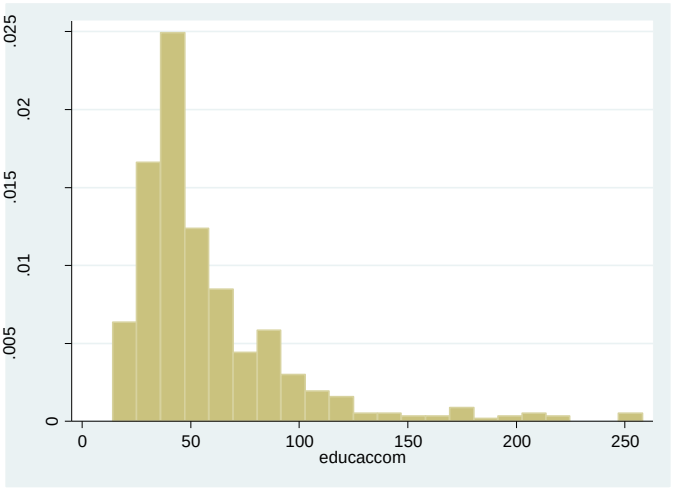
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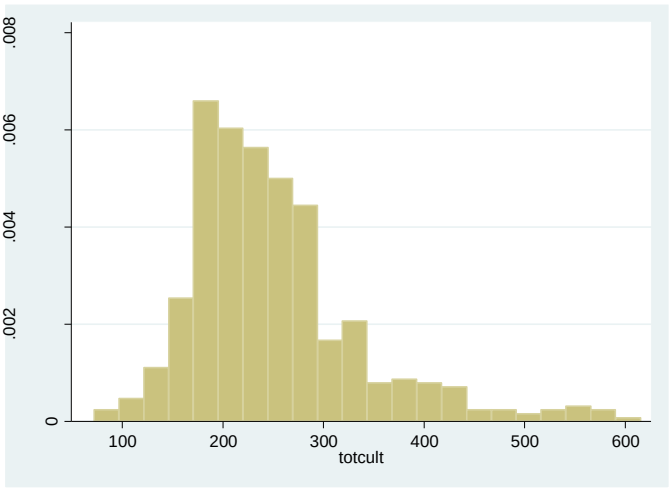
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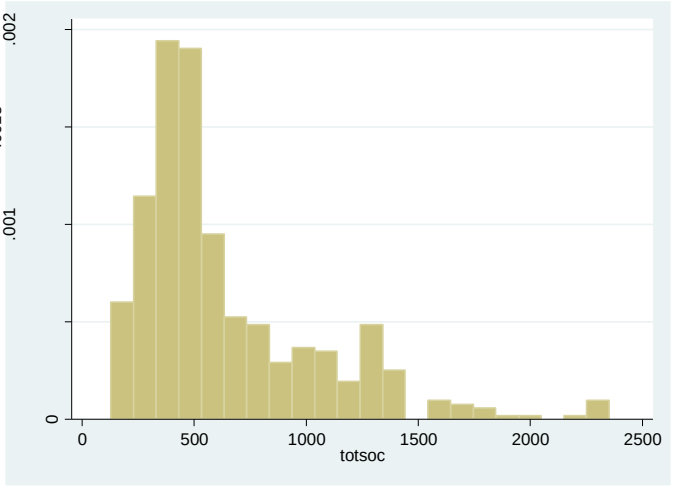
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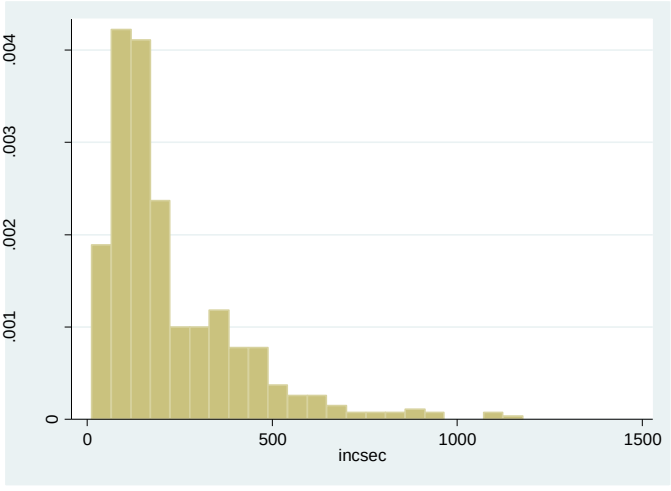
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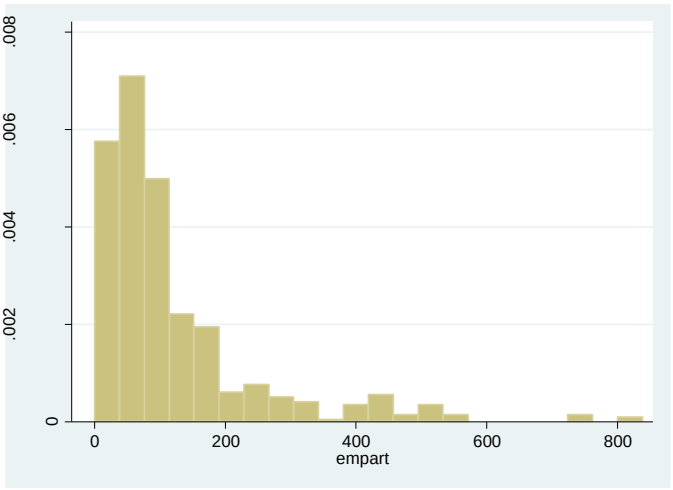
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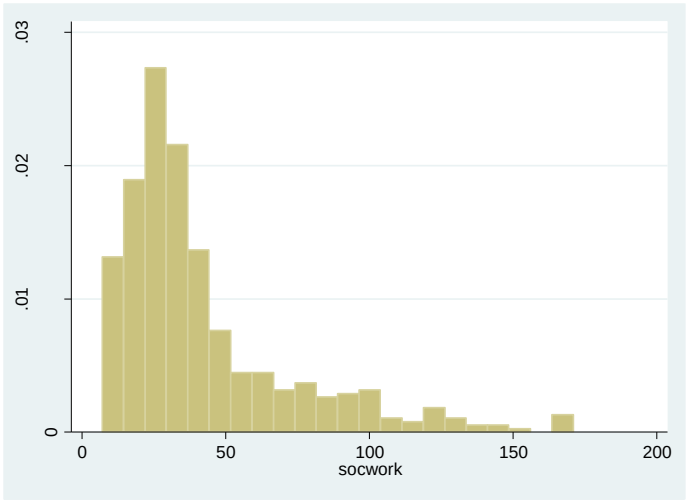
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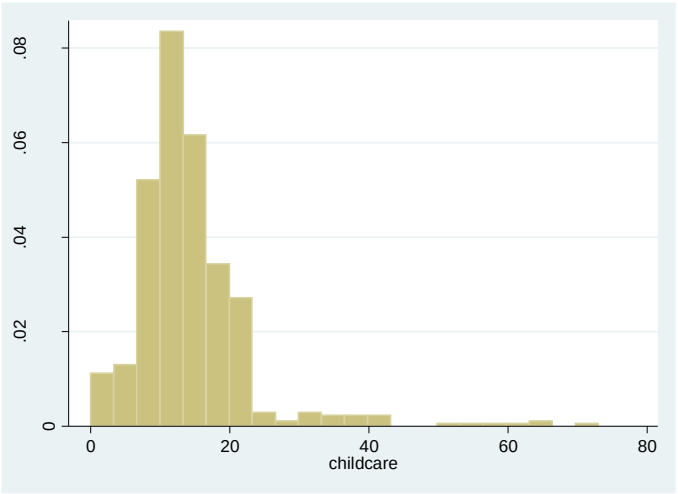
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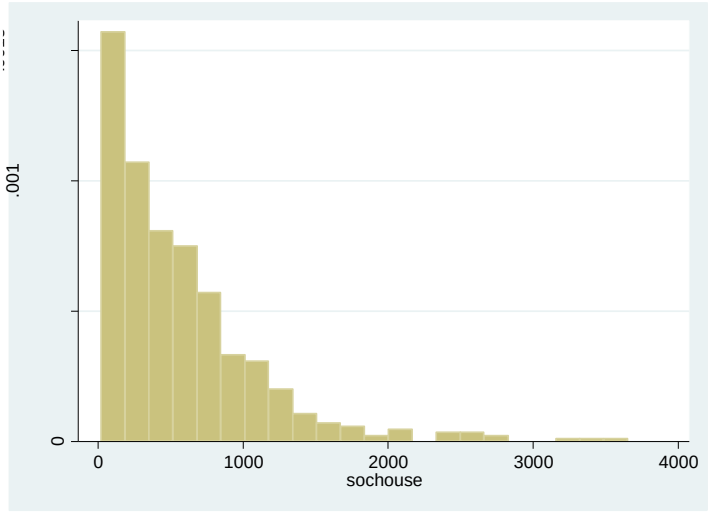
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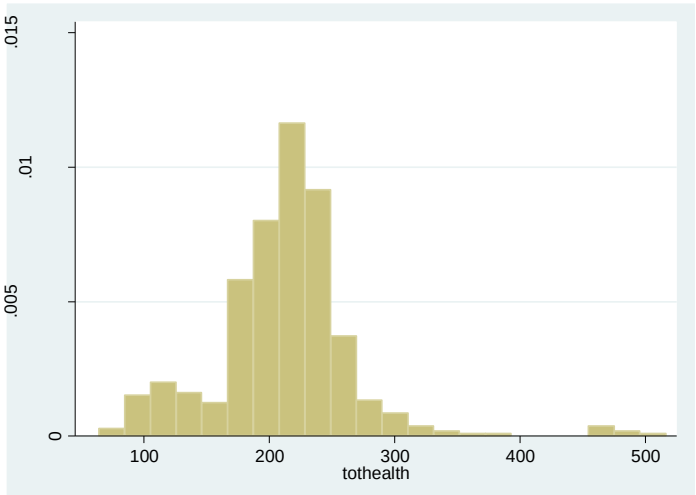
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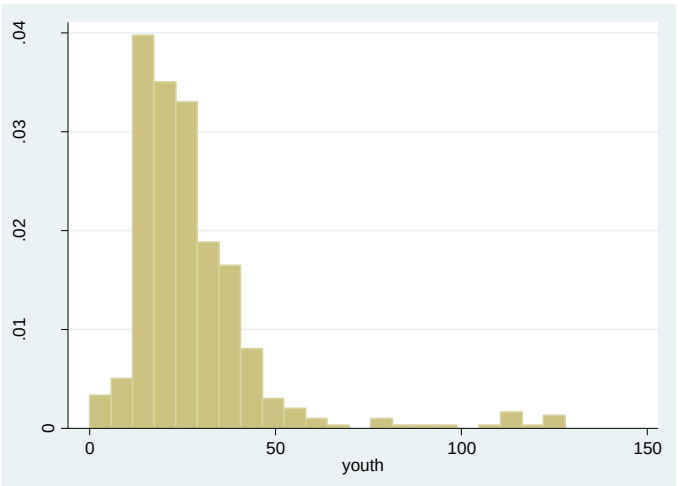
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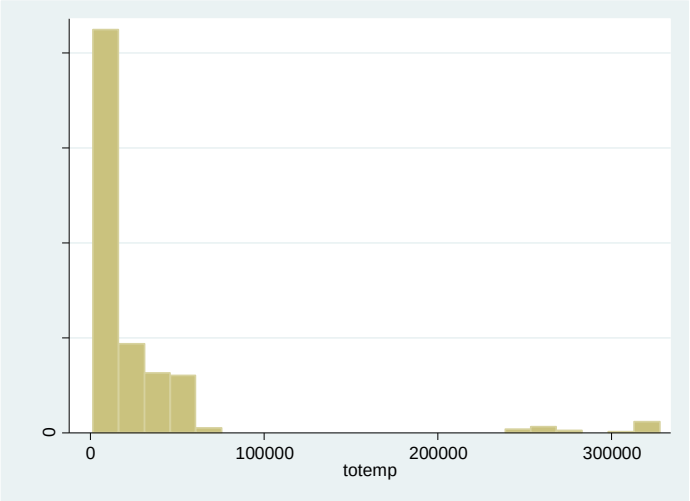
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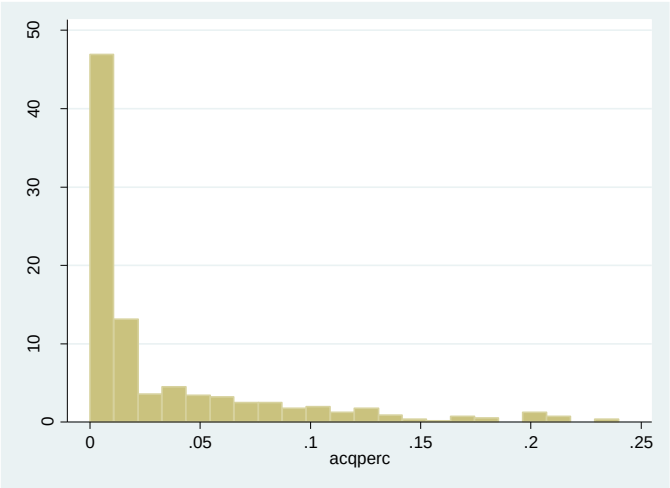
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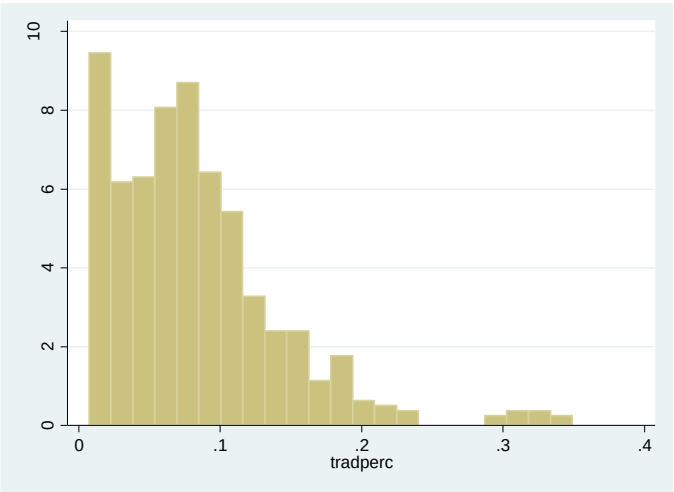
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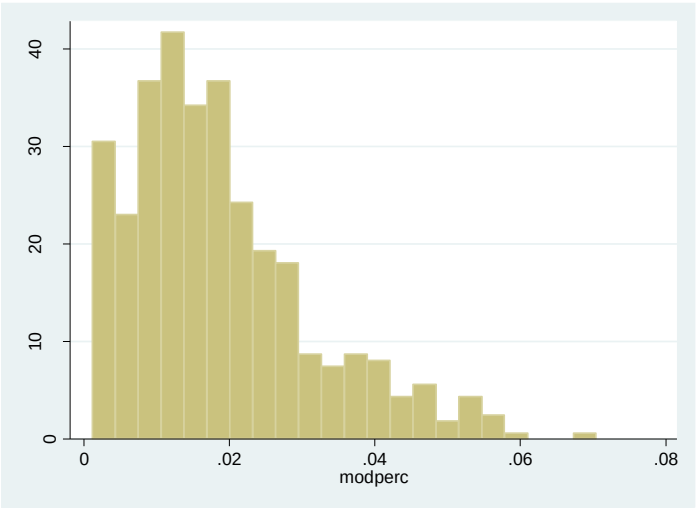
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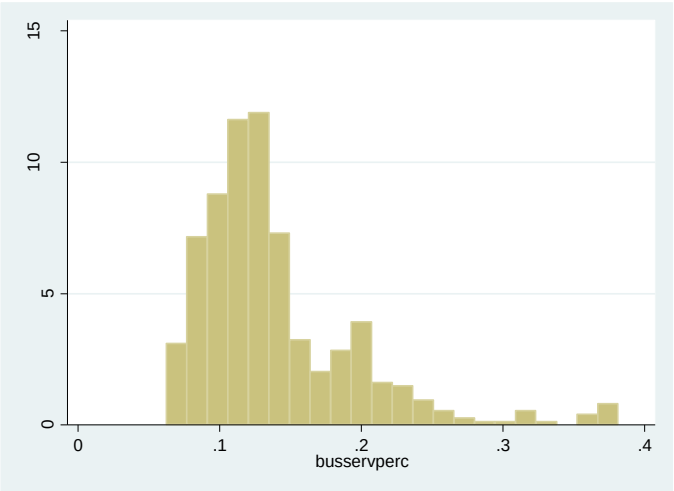
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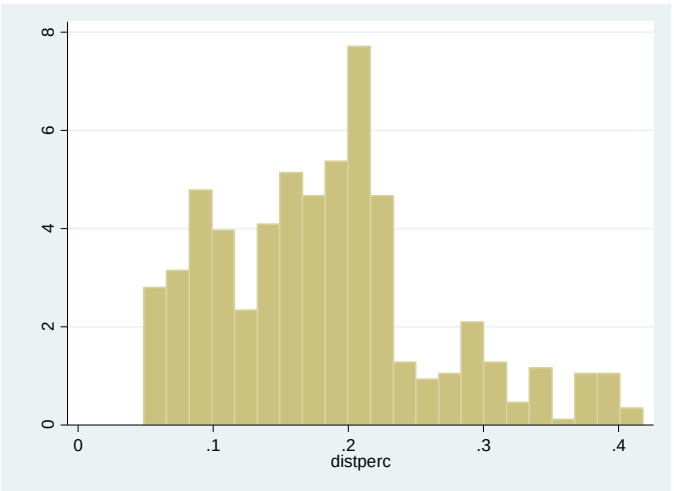
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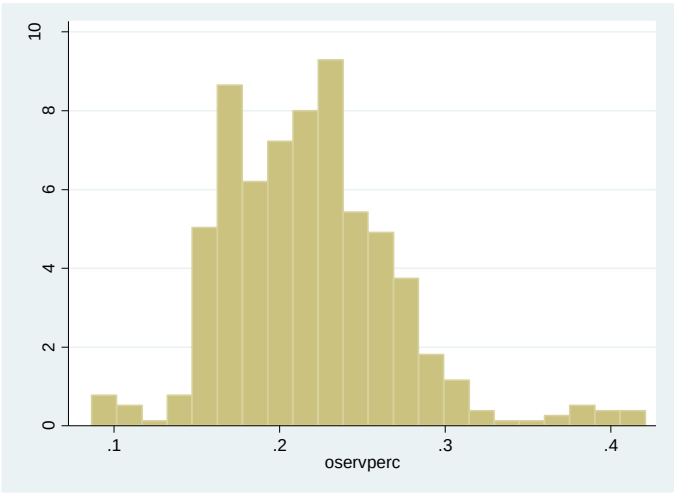
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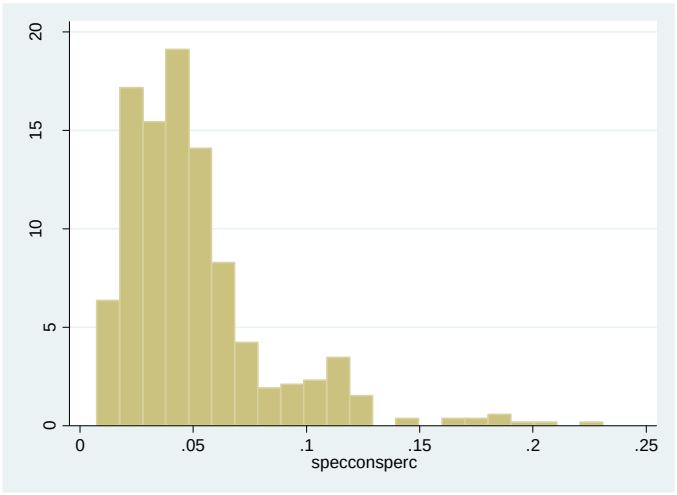
0
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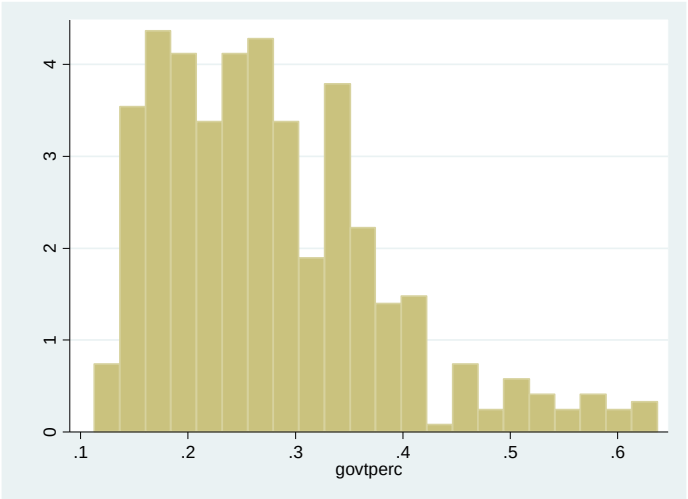
specconsperc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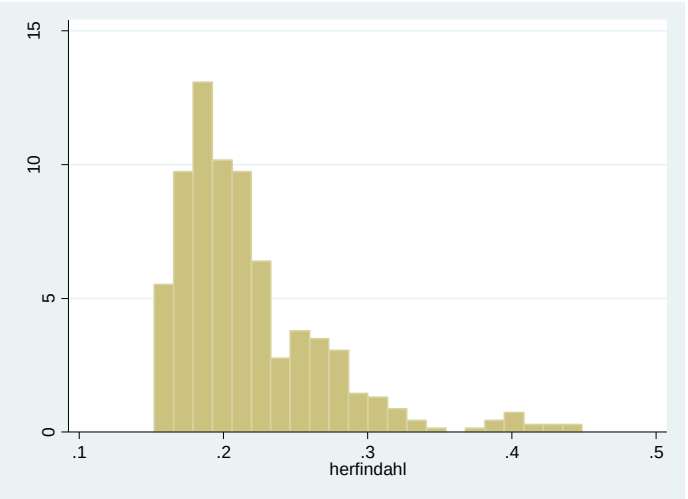
govtperc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herfindahl

ADDITIONAL RESULTS GRAPHS

2005 Basic Unemployment:

Source	SS	df	MS	Number of obs	=	50
				F(2, 47)	=	25.10
Model	1.34612205	2	.673061024	Prob > F	=	0.0000
Residual	1.2604591	47	.026818279	R-squared	=	0.5164
				Adj R-squared	=	0.4959
Total	2.60658115	49	.053195534	Root MSE	=	.16376

2005 Basic Employment:

```
. reg logtotemp logtotecon logempart
```

Source	SS	df	MS	Number of obs	=	50
				F(2, 47)	=	20.53
Model	26.1332362	2	13.0666181	Prob > F	=	0.0000
Residual	29.9097344	47	.636377328	R-squared	=	0.4663
				Adj R-squared	=	0.4436
Total	56.0429706	49	1.14373409	Root MSE	=	.79773

logtotemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.2045621	.1305982	1.57	0.124	-.0581676	.4672918
logempart	.3630729	.0799437	4.54	0.000	.2022469	.523899
_cons	7.710433	.3122684	24.69	0.000	7.08223	8.338636

```
. drop residuals

. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

				joint	
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
residuals	50	0.8318	0.8949	0.06	0.9692

```
. ovtest

Ramsey RESET test using powers of the fitted values of logtotemp
       Ho:  model has no omitted variables
                  F(3, 44) =      2.39
                  Prob > F =      0.0813
```

2005 Demographics model unemployment:

Source	SS	df	MS	Number of obs	=	50
				F(15, 34)	=	27.21
Model	2.40614433	15	.160409622	Prob > F	=	0.0000
Residual	.200436825	34	.005895201	R-squared	=	0.9231
				Adj R-squared	=	0.8892
Total	2.60658115	49	.053195534	Root MSE	=	.07678

2005 Demographics model employment:

Source	SS	df	MS	Number of obs	=	50
				F(15, 34)	=	26.62
Model	51.6451646	15	3.44301097	Prob > F	=	0.0000
Residual	4.397806	34	.129347235	R-squared	=	0.9215
				Adj R-squared	=	0.8869
Total	56.0429706	49	1.14373409	Root MSE	=	.35965

logtotemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.0033472	.0687091	-0.05	0.961	-.142981	.1362865
logempart	-.0095095	.0544185	-0.17	0.862	-.1201011	.1010822
logpop1524	-.5815856	.6448716	-0.90	0.373	-1.892122	.7289511
logpop2544	.3398217	1.301244	0.26	0.796	-2.304624	2.984267
logpop4564	.2828112	1.07022	0.26	0.793	-1.892138	2.457761
logpop6580	-.1363151	.759977	-0.18	0.859	-1.680774	1.408144
logpop80plus	-.2261305	.302351	-0.75	0.460	-.8405816	.3883206
logpopdens	-.0129857	.0945988	-0.14	0.892	-.2052336	.1792623
logwest	-.1389965	.2869209	-0.48	0.631	-.72209	.444097
lognwest	-.0328015	.2131892	-0.15	0.879	-.4660542	.4004512
lognwesto	.5549952	.2528252	2.20	0.035	.0411926	1.068798
loghh	.9466773	.1174191	8.06	0.000	.708053	1.185302
hhchild	.180625	2.303228	0.08	0.938	-4.500098	4.861348
lowinc	5.664833	2.992228	1.89	0.067	-.4161062	11.74577
loginactivepop	-.5554708	.7295374	-0.76	0.452	-2.038069	.9271275
_cons	-2.508838	4.875719	-0.51	0.610	-12.41749	7.399816

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         50      0.0030        0.0538       10.39         0.0055

. ovtest

Ramsey RESET test using powers of the fitted values of logtotemp
       Ho:  model has no omitted variables
                  F(3, 31) =      0.25
                  Prob > F =      0.8640
```

2005 Policy model unemployment:

Source	SS	df	MS	Number of obs	=	49
				F(10, 38)	=	15.64
Model	2.05860144	10	.205860144	Prob > F	=	0.0000
Residual	.500188599	38	.013162858	R-squared	=	0.8045
				Adj R-squared	=	0.7531
Total	2.55879004	48	.053308126	Root MSE	=	.11473

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

				joint	
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
residuals	49	0.0307	0.3818	5.27	0.0719

```
. ovtest

Ramsey RESET test using powers of the fitted values of logunemp
       Ho:  model has no omitted variables
                  F(3, 35) =      4.66
                  Prob > F =      0.0076
```

2005 Policy model employment:

Source	SS	df	MS	Number of obs	=	49
				F(10, 38)	=	8.54
Model	37.6537743	10	3.76537743	Prob > F	=	0.0000
Residual	16.7503405	38	.440798433	R-squared	=	0.6921
				Adj R-squared	=	0.6111
Total	54.4041148	48	1.13341906	Root MSE	=	.66393

logtotemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0719229	.1265317	0.57	0.573	-.1842271	.3280729
logempart	.051436	.1188152	0.43	0.668	-.1890928	.2919648
logtoteduc	-.0574632	.1658399	-0.35	0.731	-.3931886	.2782621
logincsec	.4711369	.2136265	2.21	0.034	.0386727	.9036011
logchildcare	.3805677	.1823236	2.09	0.044	.0114728	.7496626
logsochouse	-.134374	.1059985	-1.27	0.213	-.3489567	.0802088
logyouth	.2187086	.1918635	1.14	0.261	-.1696988	.6071161
logtotorder	.2868723	.373756	0.77	0.448	-.4697572	1.043502
logtothealth	.1166025	.3409564	0.34	0.734	-.5736277	.8068327
logtotcult	.9099612	.406973	2.24	0.031	.0860875	1.733835
_cons	-.3897754	2.620662	-0.15	0.883	-5.695028	4.915477

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         49     0.0064        0.0753        9.01          0.0111

. ovtest

Ramsey RESET test using powers of the fitted values of logtotemp
       Ho:  model has no omitted variables
                  F(3, 35) =      0.65
                  Prob > F =      0.5875
```

2005 Industrial model: unemployment

```
      Source |       SS           df       MS      Number of obs   =        49
-------------+----------------------------------   F(10, 38)       =     13.21
       Model |  2.02015215        10  .202015215   Prob > F        =    0.0000
    Residual |  .581246307        38  .015295955   R-squared       =    0.7766
-------------+----------------------------------   Adj R-squared   =    0.7178
       Total |  2.60139845        48  .054195801   Root MSE        =    .12368

. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         49     0.4172        0.0146        6.16          0.0460

. ovtest

Ramsey RESET test using powers of the fitted values of logunemp
       Ho:  model has no omitted variables
                  F(3, 35) =      3.35
                  Prob > F =      0.0299
```

2005 Industrial model: employment

Source	SS	df	MS	Number of obs	=	49
				F(10, 38)	=	8.57
Model	38.6933954	10	3.86933954	Prob > F	=	0.0000
Residual	17.1553829	38	.451457445	R-squared	=	0.6928
				Adj R-squared	=	0.6120
Total	55.8487784	48	1.16351622	Root MSE	=	.67191

logtotemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0888896	.1342408	0.66	0.512	-.1828667	.3606458
logempart	.1975868	.0834229	2.37	0.023	.0287061	.3664675
logacqperc	-.0165003	.0815663	-0.20	0.841	-.1816227	.1486222
logtradperc	-.0637302	.2250906	-0.28	0.779	-.5194022	.3919419
logmodperc	.2112942	.1350335	1.56	0.126	-.0620668	.4846552
logbusservperc	.9509314	.3815392	2.49	0.017	.1785457	1.723317
logdistperc	.6440705	.3870277	1.66	0.104	-.1394261	1.427567
logoservperc	-.6506878	.500312	-1.30	0.201	-1.663517	.3621409
loggovtperc	.9848323	.5667245	1.74	0.090	-.1624414	2.132106
logherfindahl	-.4170782	1.154187	-0.36	0.720	-2.753608	1.919452
_cons	12.02322	3.785771	3.18	0.003	4.359323	19.68711

```
. drop residuals

. predict residuals
(option xb assumed; fitted values)
(2 missing values generated)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	49	0.8844	0.3045	1.12	0.5708

```
. ovtest

Ramsey RESET test using powers of the fitted values of logtotemp
       Ho:  model has no omitted variables
                  F(3, 35) =      2.25
                  Prob > F =      0.0993
```

```
. reg logunemp logtotecon logempart
```

Source	SS	df	MS	Number of obs	=	50
				F(2, 47)	=	33.20
Model	1.19164562	2	.595822808	Prob > F	=	0.0000
Residual	.843394296	47	.017944559	R-squared	=	0.5856
				Adj R-squared	=	0.5679
Total	2.03503991	49	.041531427	Root MSE	=	.13396

logunemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0837344	.0194571	4.30	0.000	.0445917	.122877
logempart	.1765482	.0320045	5.52	0.000	.1121635	.2409329
_cons	-3.814976	.1429446	-26.69	0.000	-4.102544	-3.527409

```
. predict residuals
variable residuals already defined
r(110);

. drop residuals

. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	Prob>chi2
residuals	50	0.0152	0.4853	5.98	0.0504

```
. ovtest

Ramsey RESET test using powers of the fitted values of logunemp
       Ho:  model has no omitted variables
                  F(3, 44) =      0.85
                  Prob > F =      0.4765
```

2013 Basic Model: Employment

```
. reg logtotemp logtotecon logempart
```

Source	SS	df	MS	Number of obs	=	50
				F(2, 47)	=	31.92
Model	31.6229697	2	15.8114849	Prob > F	=	0.0000
Residual	23.284461	47	.495414064	R-squared	=	0.5759
				Adj R-squared	=	0.5579
Total	54.9074307	49	1.12055981	Root MSE	=	.70386

logtotemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.4851503	.1022342	4.75	0.000	.2794816	.6908189
logempart	.8279442	.1681622	4.92	0.000	.4896454	1.166243
_cons	4.293138	.751079	5.72	0.000	2.782162	5.804114

```
. drop residuals

. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

				joint	
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
residuals	50	0.0106	0.3858	6.64	0.0361

```
. ovtest

Ramsey RESET test using powers of the fitted values of logtotemp
       Ho:  model has no omitted variables
                  F(3, 44) =      0.65
                  Prob > F =      0.5860
```

2013 Demographics model: Unemployment

Source	SS	df	MS	Number of obs	=	50
				F(15, 34)	=	27.59
Model	1.88052724	15	.125368483	Prob > F	=	0.0000
Residual	.154512667	34	.00454449	R-squared	=	0.9241
				Adj R-squared	=	0.8906
Total	2.03503991	49	.041531427	Root MSE	=	.06741

Source	SS	df	MS	Number of obs	=	50
				F(15, 34)	=	36.29
Model	51.6792927	15	3.44528618	Prob > F	=	0.0000
Residual	3.22813806	34	.094945237	R-squared	=	0.9412
				Adj R-squared	=	0.9153
Total	54.9074307	49	1.12055981	Root MSE	=	.30813

logtotemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.134604	.0670742	2.01	0.053	-.0017071	.270915
logempart	.3981977	.1772902	2.25	0.031	.0379008	.7584947
logpop1524	.6113569	.624863	0.98	0.335	-.6585174	1.881231
logpop2544	-.1198073	.9751957	-0.12	0.903	-2.101643	1.862029
logpop4564	1.408885	1.192479	1.18	0.246	-1.014524	3.832294
logpop6580	.2083003	.7040468	0.30	0.769	-1.222495	1.639095
logpop80plus	-.1729942	.4162726	-0.42	0.680	-1.018962	.6729735
logpopdens	-.0231386	.0847741	-0.27	0.787	-.1954203	.1491432
logwest	.2255214	.2558088	0.88	0.384	-.2943446	.7453874
lognwest	.1023097	.2115691	0.48	0.632	-.3276504	.5322698
lognwesto	.0950205	.2439419	0.39	0.699	-.4007291	.5907701
loghh	.9615346	.1079695	8.91	0.000	.7421142	1.180955
hhchild	2.138888	1.875364	1.14	0.262	-1.67231	5.950087
lowinc	3.510797	2.772581	1.27	0.214	-2.123765	9.14536
loginactivepop	-1.339975	.9330705	-1.44	0.160	-3.236202	.5562528
_cons	-2.293725	4.532588	-0.51	0.616	-11.50505	6.917603

```
. drop residuals

. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	50	0.0043	0.0835	9.40	0.0091

```
. ovtest

Ramsey RESET test using powers of the fitted values of logtotemp
       Ho:  model has no omitted variables
                  F(3, 31) =      0.35
                  Prob > F =      0.7901
```

2013 Policy Model: Unemployment

Source	SS	df	MS	Number of obs	=	49
				F(11, 37)	=	39.47
Model	1.86548092	11	.169589175	Prob > F	=	0.0000
Residual	.158979151	37	.004296734	R-squared	=	0.9215
				Adj R-squared	=	0.8981
Total	2.02446007	48	.042176252	Root MSE	=	.06555

2013 Policy Model: Employment

Source	SS	df	MS	Number of obs	=	49
				F(11, 37)	=	9.83
Model	40.7430752	11	3.70391593	Prob > F	=	0.0000
Residual	13.9355313	37	.37663598	R-squared	=	0.7451
				Adj R-squared	=	0.6694
Total	54.6786065	48	1.13913764	Root MSE	=	.61371

logtotemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.2134284	.1167403	1.83	0.076	-.0231098	.4499667
logempart	.259831	.2095806	1.24	0.223	-.1648196	.6844816
logtoteduc	-.2816201	.3755268	-0.75	0.458	-1.04251	.4792694
logincsec	.8467314	.2653093	3.19	0.003	.3091637	1.384299
logchildcare	.0050494	.1754827	0.03	0.977	-.3505124	.3606111
logsochouse	.1138705	.1143145	1.00	0.326	-.1177527	.3454936
logyouth	.2492777	.2376085	1.05	0.301	-.2321629	.7307182
logsocwork	.2139533	.2087687	1.02	0.312	-.2090523	.6369589
logtotorder	.2533192	.3460917	0.73	0.469	-.4479292	.9545677
logtotcult	.4118714	.3602336	1.14	0.260	-.3180313	1.141774
logtothealth	-.185624	.4645617	-0.40	0.692	-1.126915	.7556673
_cons	-.1872734	2.572091	-0.07	0.942	-5.398825	5.024278

```
. drop residuals

. predict residuals
(option xb assumed; fitted values)
(2 missing values generated)

. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)   Prob>chi2
-------------+---------------------------------------------------------------
   residuals |         49     0.0127        0.4859        6.21         0.0449

. ovtest

Ramsey RESET test using powers of the fitted values of logtotemp
       Ho:  model has no omitted variables
                  F(3, 34) =      3.55
                  Prob > F =      0.0245

.
```

2013 Industrial model: unemployment

Source	SS	df	MS	Number of obs	=	50
				F(10, 39)	=	10.35
Model	1.47812125	10	.147812125	Prob > F	=	0.0000
Residual	.556918659	39	.014279966	R-squared	=	0.7263
				Adj R-squared	=	0.6562
Total	2.03503991	49	.041531427	Root MSE	=	.1195

2013 Industrial model: employment

Source	SS	df	MS	Number of obs	=	50
				F(10, 39)	=	13.08
Model	42.2956483	10	4.22956483	Prob > F	=	0.0000
Residual	12.6117824	39	.323379037	R-squared	=	0.7703
				Adj R-squared	=	0.7114
Total	54.9074307	49	1.12055981	Root MSE	=	.56866

logtotemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.2582573	.1030342	2.51	0.016	.0498509	.4666636
logempart	.7123268	.2279895	3.12	0.003	.2511745	1.173479
logacqperc	-.0109749	.0811764	-0.14	0.893	-.1751697	.1532198
logtradperc	-.5959543	.2808657	-2.12	0.040	-1.164059	-.0278498
logmodperc	.0389482	.1600857	0.24	0.809	-.2848557	.3627521
logbusservperc	.8728156	.3551701	2.46	0.019	.1544163	1.591215
logdistperc	.4770066	.3509688	1.36	0.182	-.2328948	1.186908
logoservperc	-1.117943	.5338587	-2.09	0.043	-2.197774	-.038112
loggovtperc	.8371448	.5976841	1.40	0.169	-.3717854	2.046075
logherfindahl	-1.577791	1.150966	-1.37	0.178	-3.905839	.7502578
_cons	3.559491	4.434676	0.80	0.427	-5.410489	12.52947

```
. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         50      0.1569        0.8201        2.17         0.3386

. ovtest

Ramsey RESET test using powers of the fitted values of logtotemp
       Ho:  model has no omitted variables
                  F(3, 36) =      0.72
                  Prob > F =      0.5467
```

2005 Growth basic model: Employment

```
. reg logempgrowthearly logtotecon logempart
```

Source	SS	df	MS	Number of obs	=	50
				F(2, 47)	=	1.14
Model	.002390584	2	.001195292	Prob > F	=	0.3290
Residual	.049353177	47	.001050068	R-squared	=	0.0462
				Adj R-squared	=	0.0056
Total	.051743761	49	.001055995	Root MSE	=	.0324

logempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0080043	.005305	1.51	0.138	-.0026681	.0186766
logempart	-.0025328	.0032474	-0.78	0.439	-.0090657	.0040002
_cons	-.0049561	.0126847	-0.39	0.698	-.0304744	.0205622

```
. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

				joint	
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
residuals	50	0.7354	0.3497	1.03	0.5979

```
. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 44) =      0.47
                  Prob > F =      0.7057
```

2005 Growth Demographics model: unemployment

Source	SS	df	MS	Number of obs	=	50
				F(15, 34)	=	2.48
Model	.049478118	15	.003298541	Prob > F	=	0.0138
Residual	.045135119	34	.001327503	R-squared	=	0.5230
				Adj R-squared	=	0.3125
Total	.094613237	49	.001930882	Root MSE	=	.03643

2005 Growth demographics model: employment

```
. reg logempgrowthearly logtotecon logempart logpop1524 logpop2544 logpop4564 log
> lowinc loginactivepop
```

Source	SS	df	MS	Number of obs	=	50
				F(15, 34)	=	1.25
Model	.018381663	15	.001225444	Prob > F	=	0.2859
Residual	.033362098	34	.000981238	R-squared	=	0.3552
				Adj R-squared	=	0.0708
Total	.051743761	49	.001055995	Root MSE	=	.03132

logempgrowth~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0133148	.0059844	2.22	0.033	.0011529	.0254766
logempart	.0023774	.0047397	0.50	0.619	-.0072549	.0120097
logpop1524	-.0241309	.0561671	-0.43	0.670	-.1382762	.0900143
logpop2544	-.0162902	.1133359	-0.14	0.887	-.2466164	.2140359
logpop4564	-.1734185	.0932141	-1.86	0.071	-.3628524	.0160154
logpop6580	-.0019856	.0661926	-0.03	0.976	-.136505	.1325339
logpop80plus	-.0156532	.0263342	-0.59	0.556	-.0691707	.0378643
logpopdens	.0083624	.0082394	1.01	0.317	-.008382	.0251069
logwest	.0426438	.0249903	1.71	0.097	-.0081425	.0934301
lognwest	-.0374271	.0185684	-2.02	0.052	-.0751626	.0003083
lognwesto	-.0152438	.0220206	-0.69	0.493	-.059995	.0295075
loghh	.011712	.010227	1.15	0.260	-.0090718	.0324957
hhchild	.3681528	.2006068	1.84	0.075	-.0395293	.7758348
lowinc	-.1721934	.2606174	-0.66	0.513	-.7018317	.3574448
loginactivepop	.0550227	.0635413	0.87	0.393	-.0741088	.1841542
_cons	-.5975251	.4246658	-1.41	0.168	-1.46055	.2654997

```
. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. drop residuals

. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         50     0.8604        0.0596        3.80          0.1497

. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 31) =      1.64
                  Prob > F =      0.2000
```

2005 Growth policy model: Unemployment

Source	SS	df	MS	Number of obs	=	49
				F(11, 37)	=	2.27
Model	.037950749	11	.003450068	Prob > F	=	0.0312
Residual	.056341867	37	.001522753	R-squared	=	0.4025
				Adj R-squared	=	0.2248
Total	.094292616	48	.001964429	Root MSE	=	.03902

2005 Growth policy model: employment

```
. reg logempgrowthearly logtotecon logempart logtoteduc logincsec logchildcare
```

Source	SS	df	MS	Number of obs	=	49
				F(11, 37)	=	0.73
Model	.009241205	11	.00084011	Prob > F	=	0.7019
Residual	.042502494	37	.001148716	R-squared	=	0.1786
				Adj R-squared	=	-0.0656
Total	.051743699	48	.001077994	Root MSE	=	.03389

logempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0063354	.0064781	0.98	0.334	-.0067905	.0194613
logempart	-.000066	.0060847	-0.01	0.991	-.0123949	.0122629
logtoteduc	.0064463	.008576	0.75	0.457	-.0109303	.0238229
logincsec	-.0047437	.0114865	-0.41	0.682	-.0280176	.0185302
logchildcare	.0043528	.0095771	0.45	0.652	-.0150524	.0237579
logsochouse	.0087177	.0054163	1.61	0.116	-.0022568	.0196921
logyouth	-.0076099	.0099363	-0.77	0.449	-.0277427	.0125229
logsocwork	-.00756	.0119284	-0.63	0.530	-.0317293	.0166094
logtotorder	-.0075109	.01951	-0.38	0.702	-.0470419	.03202
logtotcult	-.004816	.0212556	-0.23	0.822	-.0478839	.0382519
logtothealth	.0070262	.017423	0.40	0.689	-.0282762	.0423286
_cons	-.01571	.1364534	-0.12	0.909	-.2921908	.2607707

```
. predict residuals
(option xb assumed; fitted values)
(2 missing values generated)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	49	0.1263	0.8785	2.49	0.2873

```
. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 34) =      0.50
                  Prob > F =      0.6853
```

2005 Growth industry model: Unemployment

Source	SS	df	MS	Number of obs	=	49
				F(10, 38)	=	3.86
Model	.044713461	10	.004471346	Prob > F	=	0.0012
Residual	.044036859	38	.001158865	R-squared	=	0.5038
				Adj R-squared	=	0.3732
Total	.088750321	48	.001848965	Root MSE	=	.03404

2005 Growth industry model: employment

Source	SS	df	MS	Number of obs	=	49
				F(10, 38)	=	0.45
Model	.00540286	10	.000540286	Prob > F	=	0.9140
Residual	.046122841	38	.001213759	R-squared	=	0.1049
				Adj R-squared	=	-0.1307
Total	.051525702	48	.001073452	Root MSE	=	.03484

logempgrowth~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0100864	.0069605	1.45	0.156	-.0040044	.0241773
logempart	-.0014459	.0043256	-0.33	0.740	-.0102026	.0073107
logacqperc	.003176	.0042293	0.75	0.457	-.0053857	.0117378
logtradperc	.0020741	.0116712	0.18	0.860	-.021553	.0257012
logmodperc	-.0016559	.0070016	-0.24	0.814	-.0158299	.0125182
logbusservperc	-.0004171	.0197832	-0.02	0.983	-.0404661	.039632
logdistperc	.0112873	.0200678	0.56	0.577	-.0293379	.0519124
logoservperc	.0023125	.0259417	0.09	0.929	-.0502037	.0548288
loggovtperc	-.0056319	.0293853	-0.19	0.849	-.0651193	.0538555
logherfindahl	.0436376	.0598459	0.73	0.470	-.077514	.1647893
_cons	.0821711	.1962963	0.42	0.678	-.31521	.4795523

```
. predict residuals
(option xb assumed; fitted values)
(2 missing values generated)

. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         49     0.0516        0.1056        5.99         0.0499

. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 35) =      1.36
                  Prob > F =      0.2706
```

2009 Growth basic model: employment

```
. reg logempgrowthearly logtotecon logempart
```

Source	SS	df	MS	Number of obs	=	51
				F(2, 48)	=	5.00
Model	18.6969335	2	9.34846676	Prob > F	=	0.0106
Residual	89.6776207	48	1.86828377	R-squared	=	0.1725
				Adj R-squared	=	0.1380
Total	108.374554	50	2.16749108	Root MSE	=	1.3669

logempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.3059856	.1943679	-1.57	0.122	-.6967884	.0848171
logempart	-.4848298	.2669749	-1.82	0.076	-1.021619	.0519593
_cons	3.150288	1.192457	2.64	0.011	.7526931	5.547883

```
. predict residuals
(option xb assumed; fitted values)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

				joint	
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
residuals	51	0.0148	0.2360	6.69	0.0352

```
. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                   F(3, 45) =      0.08
                   Prob > F =      0.9695
```

2009 Growth basic model: Unemployment

Source	SS	df	MS	Number of obs	=	51
				F(15, 35)	=	3.29
Model	1.42547778	15	.095031852	Prob > F	=	0.0018
Residual	1.01045031	35	.028870009	R-squared	=	0.5852
				Adj R-squared	=	0.4074
Total	2.4359281	50	.048718562	Root MSE	=	.16991

2009 Growth basic model: employment

Source	SS	df	MS	Number of obs	=	51
				F(15, 35)	=	4.32
Model	70.3536601	15	4.69024401	Prob > F	=	0.0002
Residual	38.0208941	35	1.08631126	R-squared	=	0.6492
				Adj R-squared	=	0.4988
Total	108.374554	50	2.16749108	Root MSE	=	1.0423

logempgrowth~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0412139	.1929117	0.21	0.832	-.3504177	.4328455
logempart	.2420022	.3985677	0.61	0.548	-.5671333	1.051138
logpop1524	-.9075433	1.961034	-0.46	0.646	-4.888655	3.073568
logpop2544	1.453049	3.419938	0.42	0.674	-5.489794	8.395892
logpop4564	-3.603959	3.157371	-1.14	0.261	-10.01376	2.805845
logpop6580	1.376877	2.244499	0.61	0.544	-3.179698	5.933452
logpop80plus	-.7063567	1.018154	-0.69	0.492	-2.773319	1.360606
logpopdens	-.6182583	.2671854	-2.31	0.027	-1.160674	-.075843
logwest	.1348114	.8092455	0.17	0.869	-1.508044	1.777667
lognwest	.2514952	.6077	0.41	0.682	-.9822015	1.485192
lognwesto	.336311	.8490131	0.40	0.694	-1.387277	2.059899
loghh	-1.480812	.3439361	-4.31	0.000	-2.179039	-.7825842
hhchild	-4.520204	7.052937	-0.64	0.526	-18.83843	9.798019
lowinc	-7.395266	9.167279	-0.81	0.425	-26.00583	11.2153
loginactivepop	.9224766	3.020256	0.31	0.762	-5.208968	7.053921
_cons	21.8364	14.62411	1.49	0.144	-7.852117	51.52493

```
. drop residuals

. predict residuals
(option xb assumed; fitted values)

. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         51     0.0405        0.3468        5.00          0.0822

. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 32) =      0.42
                  Prob > F =      0.7370
```

2009 Growth policy model: Unemployment

Source	SS	df	MS	Number of obs	=	51
				F(11, 39)	=	2.98
Model	1.11252669	11	.10113879	Prob > F	=	0.0058
Residual	1.32340141	39	.03393337	R-squared	=	0.4567
				Adj R-squared	=	0.3035
Total	2.4359281	50	.048718562	Root MSE	=	.18421

2009 Growth policy model: employment

Source	SS	df	MS	Number of obs	=	51
				F(11, 39)	=	1.66
Model	34.5649492	11	3.14226811	Prob > F	=	0.1199
Residual	73.8096051	39	1.89255398	R-squared	=	0.3189
				Adj R-squared	=	0.1268
Total	108.374554	50	2.16749108	Root MSE	=	1.3757

logempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.2221832	.2473542	-0.90	0.375	-.7225043	.2781379
logempart	-.4236409	.4675452	-0.91	0.370	-1.36934	.5220586
logtoteduc	.0849492	.5698421	0.15	0.882	-1.067665	1.237564
logchildcare	-.0812892	.4402654	-0.18	0.854	-.9718101	.8092316
logsochouse	-.0893701	.2014866	-0.44	0.660	-.4969151	.3181749
logyouth	-.3282765	.527959	-0.62	0.538	-1.396174	.7396214
logtotorder	1.225196	.8892326	1.38	0.176	-.5734466	3.023839
logtotcult	-.612344	.9482286	-0.65	0.522	-2.530317	1.305629
logincsec	.3737488	.7019941	0.53	0.597	-1.046168	1.793666
logsocwork	-1.204089	.5700626	-2.11	0.041	-2.35715	-.0510289
logtothealth	.6971389	.9070391	0.77	0.447	-1.137521	2.531799
_cons	.5747571	6.776657	0.08	0.933	-13.13233	14.28184

```
. predict residuals
(option xb assumed; fitted values)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	51	0.0593	0.5945	4.03	0.1336

```
. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 36) =      3.49
                  Prob > F =      0.0255
```

2009 Industrial growth model: Unemployment

Source	SS	df	MS	Number of obs	=	51
				F(10, 40)	=	3.14
Model	1.07200975	10	.107200975	Prob > F	=	0.0047
Residual	1.36391834	40	.034097959	R-squared	=	0.4401
				Adj R-squared	=	0.3001
Total	2.4359281	50	.048718562	Root MSE	=	.18466

2009 Industrial growth model: Employment

Source	SS	df	MS	Number of obs	=	51
				F(10, 40)	=	2.33
Model	39.9212893	10	3.99212893	Prob > F	=	0.0283
Residual	68.453265	40	1.71133162	R-squared	=	0.3684
				Adj R-squared	=	0.2105
Total	108.374554	50	2.16749108	Root MSE	=	1.3082

logempgrowth~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0232568	.2488898	0.09	0.926	-.4797683	.5262818
logempart	-.221549	.3624483	-0.61	0.544	-.9540844	.5109864
logacqperc	.1801537	.1538262	1.17	0.248	-.1307406	.491048
logtradperc	.5161808	.5250417	0.98	0.331	-.5449681	1.57733
logmodperc	-.1584335	.3105491	-0.51	0.613	-.7860767	.4692096
logbusservperc	-1.020878	.8578858	-1.19	0.241	-2.75473	.7129737
logdistperc	-.8294423	.7926913	-1.05	0.302	-2.431531	.7726466
logoservperc	1.206462	1.092916	1.10	0.276	-1.002405	3.415328
loggovtperc	-1.80113	1.333532	-1.35	0.184	-4.496299	.8940387
logherfindahl	3.196178	2.282438	1.40	0.169	-1.416802	7.809157
_cons	3.476181	8.583966	0.40	0.688	-13.87266	20.82502

```
. predict residuals
(option xb assumed; fitted values)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	51	0.2383	0.5175	1.90	0.3866

```
. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 37) =      0.24
```

2013 Growth basic model: Employment

```
. reg logempgrowthearly logtotecon logempart
```

Source	SS	df	MS	Number of obs	=	50
				F(2, 47)	=	2.45
Model	.002452215	2	.001226108	Prob > F	=	0.0970
Residual	.023497902	47	.000499955	R-squared	=	0.0945
				Adj R-squared	=	0.0560
Total	.025950117	49	.000529594	Root MSE	=	.02236

logempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0018026	.0032477	0.56	0.582	-.004731	.0083362
logempart	-.0118292	.0053421	-2.21	0.032	-.0225761	-.0010824
_cons	.0321823	.0238598	1.35	0.184	-.0158174	.0801821

```
. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	50	0.9528	0.8586	0.04	0.9825

```
. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                   F(3, 44) =      1.98
                   Prob > F =      0.1316
```

2013 Growth Demographics Model: Unemployment

Source	SS	df	MS	Number of obs	=	50
				F(15, 34)	=	1.69
Model	.034693789	15	.002312919	Prob > F	=	0.1000
Residual	.046423415	34	.001365395	R-squared	=	0.4277
				Adj R-squared	=	0.1752
Total	.081117204	49	.001655453	Root MSE	=	.03695

2013 Growth demographics model: Employment

Source	SS	df	MS	Number of obs	=	50
				F(15, 34)	=	1.78
Model	.011413391	15	.000760893	Prob > F	=	0.0809
Residual	.014536726	34	.000427551	R-squared	=	0.4398
				Adj R-squared	=	0.1927
Total	.025950117	49	.000529594	Root MSE	=	.02068

logempgrowth~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0013847	.004501	0.31	0.760	-.0077625	.0105319
logempart	-.0161973	.0118971	-1.36	0.182	-.0403751	.0079806
logpop1524	.0406523	.0419317	0.97	0.339	-.0445631	.1258677
logpop2544	.0702769	.0654409	1.07	0.290	-.0627149	.2032687
logpop4564	.0488885	.0800217	0.61	0.545	-.1137352	.2115123
logpop6580	.0910998	.0472453	1.93	0.062	-.0049142	.1871138
logpop80plus	-.0308474	.0279341	-1.10	0.277	-.0876164	.0259215
logpopdens	-.0025741	.0056888	-0.45	0.654	-.0141351	.008987
logwest	.0095212	.0171661	0.55	0.583	-.0253646	.044407
lognwest	-.0263409	.0141974	-1.86	0.072	-.0551935	.0025118
lognwesto	-.0049276	.0163698	-0.30	0.765	-.038195	.0283399
loghh	.0004294	.0072453	0.06	0.953	-.0142948	.0151537
hhchild	.2969145	.125847	2.36	0.024	.0411626	.5526663
lowinc	-.1471207	.1860551	-0.79	0.435	-.5252301	.2309886
loginactivepop	.1958949	.062614	3.13	0.004	.0686479	.3231419
_cons	.6303737	.304161	2.07	0.046	.0122441	1.248503

```
. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         50     0.2897        0.9181        1.18         0.5543

. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 31) =      1.12
                  Prob > F =      0.3566
```

2013 Growth Policy Model: Unemployment

Source	SS	df	MS		
				Number of obs	= 49
				F(11, 37)	= 0.59
Model	.012175796	11	.001106891	Prob > F	= 0.8212
Residual	.068939811	37	.001863238	R-squared	= 0.1501
				Adj R-squared	= -0.1026
Total	.081115607	48	.001689908	Root MSE	= .04317

2013 Growth Policy Model: Employment

Source	SS	df	MS		
				Number of obs	= 49
				F(11, 37)	= 3.12
Model	.012479442	11	.001134495	Prob > F	= 0.0046
Residual	.013465699	37	.000363938	R-squared	= 0.4810
				Adj R-squared	= 0.3267
Total	.025945141	48	.000540524	Root MSE	= .01908

logempgrow~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	.0012303	.0036289	0.34	0.737	-.0061225	.0085831
logempart	-.0115742	.0065148	-1.78	0.084	-.0247745	.0016261
logtoteduc	.0160438	.0116733	1.37	0.178	-.0076085	.0396962
logincsec	-.0065113	.0082472	-0.79	0.435	-.0232217	.0101991
logsochouse	.0137093	.0035535	3.86	0.000	.0065092	.0209093
logchildcare	-.0017498	.0054549	-0.32	0.750	-.0128025	.0093029
logyouth	-.0046248	.0073861	-0.63	0.535	-.0195905	.0103408
logsocwork	.0010125	.0064896	0.16	0.877	-.0121367	.0141617
logtotorder	.0114209	.0107583	1.06	0.295	-.0103775	.0332193
logtotcult	.0010239	.0111979	0.09	0.928	-.0216652	.023713
logtothealth	-.0222418	.014441	-1.54	0.132	-.0515019	.0070184
_cons	-.0158017	.0799538	-0.20	0.844	-.1778035	.1462001

```
. predict residuals
(option xb assumed; fitted values)
(2 missing values generated)

. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         49     0.2293        0.1223        4.02          0.1339

. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 34) =      0.87
                  Prob > F =      0.4677
```

2013 Growth Industrial Model: Unemployment

Source	SS	df	MS	Number of obs	=	50
				F(10, 39)	=	0.50
Model	.009258595	10	.000925859	Prob > F	=	0.8778
Residual	.071858609	39	.001842528	R-squared	=	0.1141
				Adj R-squared	=	-0.1130
Total	.081117204	49	.001655453	Root MSE	=	.04292

2013 Growth Industrial Model: Employment

Source	SS	df	MS	Number of obs	=	50
				F(10, 39)	=	1.26
Model	.006318532	10	.000631853	Prob > F	=	0.2886
Residual	.019631585	39	.000503374	R-squared	=	0.2435
				Adj R-squared	=	0.0495
Total	.025950117	49	.000529594	Root MSE	=	.02244

logempgrowth~y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.0009585	.0040651	-0.24	0.815	-.009181	.0072639
logempart	-.0153496	.0089951	-1.71	0.096	-.0335439	.0028446
logacqperc	.0000767	.0032027	0.02	0.981	-.0064014	.0065548
logtradperc	-.0045551	.0110812	-0.41	0.683	-.026969	.0178588
logmodperc	-.0045322	.006316	-0.72	0.477	-.0173075	.0082432
logbusservperc	-.0029998	.0140128	-0.21	0.832	-.0313434	.0253438
logdistperc	-.0051194	.0138471	-0.37	0.714	-.0331278	.0228889
logoservperc	-.0465463	.0210628	-2.21	0.033	-.0891498	-.0039428
loggovtperc	.0160626	.0235809	0.68	0.500	-.0316344	.0637595
logherfindahl	-.0317417	.04541	-0.70	0.489	-.1235922	.0601087
_cons	-.090577	.1749651	-0.52	0.608	-.4444773	.2633233

```
. predict residuals
(option xb assumed; fitted values)
(1 missing value generated)

. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                      ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |         50      0.0170        0.0797        7.72         0.0211

. ovtest

Ramsey RESET test using powers of the fitted values of logempgrowthearly
       Ho:  model has no omitted variables
                  F(3, 36) =      1.03
                  Prob > F =      0.3904
```

Summary Statistics Unlogged Part 1

Variable		Mean	Std. Dev.	Min	Max	Observations	
name	overall	.	.	.	.	N =	0
	between		.	.	.	n =	0
	within		.	.	.	T =	.
id	overall	26.65957	14.55418	1	51	N =	470
	between		14.69587	1	51	n =	47
	within		0	26.65957	26.65957	T =	10
pop	overall	49615.29	71485.25	8075	508940	N =	470
	between		72141.71	8252.2	487969.6	n =	47
	within		2363.736	31799.09	70585.69	T =	10
men	overall	24427.47	35217.79	4010	251305	N =	470
	between		35538.53	4095	240222	n =	47
	within		1241.938	15521.97	35510.47	T =	10
women	overall	25187.77	36277.2	4060	257630	N =	470
	between		36612.64	4155.5	247747.5	n =	47
	within		1128.288	16282.27	35070.27	T =	10
pop14	overall	.1805191	.0192445	.127	.24	N =	470
	between		.0183693	.1365	.2338	n =	47
	within		.0062766	.1557191	.2026191	T =	10
pop1524	overall	.1190723	.0150081	.093	.199	N =	470
	between		.0146587	.0976	.1784	n =	47
	within		.0038067	.1036723	.1396723	T =	10
pop2544	overall	.2611064	.0296001	.173	.346	N =	470
	between		.0260151	.1913	.3244	n =	47
	within		.0145728	.2185064	.2956064	T =	10
pop4564	overall	.2799915	.0233833	.226	.336	N =	470
	between		.0223493	.2397	.3245	n =	47
	within		.0075415	.2564915	.3038915	T =	10
pop6580	overall	.118734	.0194293	.081	.178	N =	470
	between		.0163367	.0886	.1555	n =	47
	within		.0107578	.091834	.157834	T =	10
pop80p~s	overall	.0405362	.0097967	.021	.076	N =	470
	between		.0092494	.0243	.074	n =	47
	within		.0034738	.0304362	.0514362	T =	10
popdens	overall	1995.7	1486.873	139	6216	N =	470
	between		1500.07	140.1	5942.5	n =	47
	within		61.34244	1680.8	2485.8	T =	10
west	overall	.0841277	.0362411	.02	.22	N =	470
	between		.0362711	.025	.216	n =	47
	within		.0048032	.0691277	.1061277	T =	10
nwest	overall	.0902128	.0673213	.01	.34	N =	470
	between		.0674311	.014	.333	n =	47
	within		.0085119	.0482128	.1182128	T =	10
nwesto	overall	.0335957	.0207546	.01	.11	N =	470
	between		.0203477	.01	.096	n =	47
	within		.0049668	.0175957	.0475957	T =	10

Summary Statistics Unlogged Part 2

hh	overall	22487.33	35675.23	3080	250150	N =	470
	between		36007.21	3115.5	242753.5	n =	47
	within		1040.632	15453.33	29883.83	T =	10
hhone	overall	.3137021	.0738892	.21	.56	N =	470
	between		.0737563	.222	.534	n =	47
	within		.0111359	.2807021	.3507021	T =	10
hhnoch~d	overall	.3113617	.0313155	.22	.37	N =	470
	between		.0310584	.221	.366	n =	47
	within		.0058772	.2913617	.3363617	T =	10
hhchild	overall	.3752128	.0530343	.21	.49	N =	470
	between		.0524533	.23	.481	n =	47
	within		.0106815	.3442128	.4082128	T =	10
hhavgs~e	overall	2.333191	.2049609	1.8	2.8	N =	470
	between		.2010852	1.82	2.7	n =	47
	within		.0484735	2.203191	2.473191	T =	10
lowinc	overall	.3719255	.0301398	.29	.456	N =	470
	between		.0291961	.2957	.4234	n =	47
	within		.0085061	.3471255	.4178255	T =	10
highinc	overall	.2420617	.0449745	.17	.38	N =	470
	between		.044644	.1825	.3639	n =	47
	within		.0082379	.2161617	.2666617	T =	10
inacti~p	overall	.1782766	.0333251	.12	.29	N =	470
	between		.0325613	.136	.28	n =	47
	within		.0084066	.1407766	.2112766	T =	10
unemp	overall	.0462638	.0142183	.026	.109	N =	470
	between		.0088884	.0349	.0732	n =	47
	within		.0111657	.0170638	.0820638	T =	10
year	overall	2009.5	2.875342	2005	2014	N =	470
	between		0	2009.5	2009.5	n =	47
	within		2.875342	2005	2014	T =	10
totmuni	overall	2556.9	852.98	1057	5505	N =	470
	between		765.3937	1479.6	4460	n =	47
	within		391.1384	1002.25	4631.25	T =	10
totord~y	overall	88.00851	26.74014	35	191	N =	470
	between		22.06238	51.6	134.3	n =	47
	within		15.41516	37.95851	151.8085	T =	10
admin	overall	18.3266	6.3142	8	63	N =	470
	between		4.081891	12.25	30.7	n =	47
	within		4.850467	5.626596	57.6266	T =	10
tottra~t	overall	26.86596	34.20473	0	182	N =	470
	between		30.80465	1	115.5	n =	47
	within		15.46761	-9.634043	176.916	T =	10
totecon	overall	23.08511	26.17534	0	170	N =	470
	between		23.64964	3	106.8	n =	47
	within		11.68656	-42.11489	86.28511	T =	10
toteduc	overall	179.5787	122.7913	57	1224	N =	470
	between		82.7873	65.3	452	n =	47
	within		91.40835	-93.72128	951.5787	T =	10
educac~m	overall	56.15213	30.1045	14	209	N =	470
	between		27.746	17.9	167.5	n =	47
	within		12.29689	14.90213	180.7521	T =	10

Summary Statistics Unlogged Part 3

totcult	overall	247.0957	80.62573	72	615	N =	470
	between		74.80452	113.8	525.1	n =	47
	within		31.81467	120.9957	403.8957	T =	10
totsoc	overall	622.7761	356.8515	131	1847	N =	469
	between		344.9585	292.3	1674.5	n =	47
	within		102.3853	185.8761	867.8761	T-bar =	9.97872
incsec	overall	214.4862	155.5536	12	842	N =	470
	between		152.212	58.4	688.5	n =	47
	within		38.38007	69.28617	367.9862	T =	10
empart	overall	115.5468	115.8509	0	571	N =	470
	between		105.5939	29.7	459.3	n =	47
	within		49.85286	-77.75319	298.5468	T =	10
socwork	overall	40.94574	29.36974	7	171	N =	470
	between		26.90814	10.4	134.1	n =	47
	within		12.34618	-4.654255	87.14574	T =	10
childc~e	overall	14.42964	8.817133	0	73	N =	469
	between		8.201609	2.4	54.8	n =	47
	within		3.432913	-3.370362	36.72964	T-bar =	9.97872
sochouse	overall	572.581	546.5781	21	3652	N =	469
	between		448.694	93	2159.2	n =	47
	within		317.5891	-735.619	2471.131	T-bar =	9.97872
tothea~h	overall	209.0096	45.09004	64	366	N =	470
	between		40.14683	97.3	285.85	n =	47
	within		21.26671	121.0096	317.0096	T =	10
youth	overall	27.17234	17.50921	0	128	N =	470
	between		14.87668	13.3	119.3	n =	47
	within		9.460652	.3723404	62.37234	T =	10
totemp	overall	22131.97	38335.5	1511	269735	N =	470
	between		38682.53	1789.8	259366.3	n =	47
	within		1409.79	12091.67	32500.67	T =	10
acqperc	overall	.0319837	.0490363	0	.2399092	N =	470
	between		.0488446	.0000844	.2119562	n =	47
	within		.0080342	-.0052015	.0870893	T =	10
tradperc	overall	.0816986	.0614631	.0072062	.3491566	N =	470
	between		.0605435	.0085706	.3194228	n =	47
	within		.0135105	.0354071	.1918064	T =	10
modperc	overall	.0183905	.0128007	.0011669	.0704328	N =	470
	between		.0114547	.0017937	.046626	n =	47
	within		.0059299	-.0018631	.0680703	T =	10
busser~c	overall	.1396065	.0578555	.0623245	.381504	N =	470
	between		.0571698	.0731365	.3647129	n =	47
	within		.0118992	.0862688	.1800796	T =	10
distperc	overall	.1804288	.0832409	.0486337	.4177742	N =	470
	between		.082501	.0627316	.3901956	n =	47
	within		.0159135	.1245862	.24691	T =	10
oservp~c	overall	.2191241	.0528381	.0865411	.4206835	N =	470
	between		.0513019	.0980709	.3974845	n =	47
	within		.0145081	.1745421	.2842452	T =	10
specco~c	overall	.0501904	.0335142	.0074215	.2309062	N =	470
	between		.0323231	.0148653	.1713933	n =	47
	within		.0099231	-.008188	.1242699	T =	10
govtperc	overall	.2781092	.1075001	.1127136	.6367908	N =	470
	between		.1067362	.1385973	.5688158	n =	47
	within		.0195518	.1968693	.3488635	T =	10
herfin~l	overall	.219985	.0527458	.1519506	.4488082	N =	470
	between		.052068	.1617858	.390583	n =	47
	within		.0110934	.1466369	.2885403	T =	10

Summary Statistics Logged Part 1

Variable		Mean	Std. Dev.	Min	Max	Observations	
logpop	overall	10.40257	.8017685	8.996528	13.14009	N =	470
	between		.8090019	9.018057	13.09763	n =	47
	within		.0301339	10.05524	10.5043	T =	10
logmen	overall	9.694697	.7990358	8.296547	12.43442	N =	470
	between		.8062471	8.31734	12.38887	n =	47
	within		.0299638	9.34521	9.792325	T =	10
logwomen	overall	9.723599	.8047276	8.308938	12.45928	N =	470
	between		.8119766	8.332003	12.41985	n =	47
	within		.0305367	9.378647	9.829445	T =	10
logpop14	overall	-1.717597	.1068984	-2.063568	-1.427116	N =	470
	between		.1018238	-1.992738	-1.453533	n =	47
	within		.0354703	-1.871142	-1.595279	T =	10
log~1524	overall	-2.135133	.1166096	-2.375156	-1.61445	N =	470
	between		.1136383	-2.327069	-1.725969	n =	47
	within		.0305279	-2.258267	-2.023614	T =	10
log~2544	overall	-1.349318	.1146545	-1.754464	-1.061316	N =	470
	between		.1004814	-1.656112	-1.125926	n =	47
	within		.0569465	-1.504192	-1.209513	T =	10
log~4564	overall	-1.276532	.0845585	-1.48722	-1.090644	N =	470
	between		.0807256	-1.428776	-1.125747	n =	47
	within		.0275422	-1.357387	-1.182593	T =	10
log~6580	overall	-2.144072	.1624871	-2.513306	-1.725972	N =	470
	between		.1378828	-2.426417	-1.862643	n =	47
	within		.0880638	-2.369399	-1.862582	T =	10
logpop~s	overall	7.213945	.9996342	4.934474	8.734882	N =	470
	between		1.008975	4.942349	8.689418	n =	47
	within		.0278157	7.062665	7.390451	T =	10
logwest	overall	-2.564771	.4304782	-3.912023	-1.514128	N =	470
	between		.4294887	-3.709291	-1.532736	n =	47
	within		.0662622	-2.767504	-2.222415	T =	10
lognwest	overall	-2.691882	.7957114	-4.60517	-1.07881	N =	470
	between		.7931125	-4.327911	-1.09989	n =	47
	within		.12728	-3.315714	-2.275994	T =	10
lognwe~o	overall	-3.56937	.5976377	-4.60517	-2.207275	N =	470
	between		.5816355	-4.60517	-2.350229	n =	47
	within		.1592572	-4.193203	-2.945538	T =	10
loghh	overall	9.546363	.8586048	8.032685	12.42982	N =	470
	between		.866153	8.0441	12.39959	n =	47
	within		.0371184	9.189844	9.663768	T =	10
loghhone	overall	-1.184343	.2194419	-1.560648	-.5798185	N =	470
	between		.2179239	-1.506236	-.6278541	n =	47
	within		.0396897	-1.294175	-1.048925	T =	10
loghhn~d	overall	-1.172236	.106537	-1.514128	-.9942523	N =	470
	between		.1058715	-1.509683	-1.005212	n =	47
	within		.0188803	-1.234112	-1.089841	T =	10
loghhc~d	overall	-.9911777	.1518564	-1.560648	-.7133499	N =	470
	between		.1506617	-1.471003	-.7319506	n =	47
	within		.0282314	-1.080823	-.9064694	T =	10
loghha~e	overall	.8432463	.0903265	.5877867	1.029619	N =	470
	between		.0888361	.5986001	.99284	n =	47
	within		.0204563	.7862158	.8993307	T =	10

Summary Statistics Logged Part 2

loglow~c	overall	-.9924591	.0833196	-1.237874	-.7852625	N =	470
	between		.0808847	-1.21855	-.8595589	n =	47
	within		.0229208	-1.067136	-.8855905	T =	10
loghig~c	overall	-1.434598	.1764974	-1.771957	-.967584	N =	470
	between		.1748173	-1.702172	-1.010993	n =	47
	within		.0343032	-1.54484	-1.329531	T =	10
logina~p	overall	-1.740672	.1778218	-2.120264	-1.237874	N =	470
	between		.1728989	-1.995756	-1.273613	n =	47
	within		.0479606	-1.927158	-1.564463	T =	10
logtot~i	overall	7.793288	.3260777	6.96319	8.613412	N =	470
	between		.2921355	7.292521	8.401851	n =	47
	within		.1504035	7.148687	8.394409	T =	10
logtot~y	overall	4.430378	.311449	3.555348	5.252274	N =	470
	between		.2583835	3.923011	4.897351	n =	47
	within		.1775377	3.659551	5.098268	T =	10
logadmin	overall	2.862592	.2911019	2.079442	4.143135	N =	470
	between		.1973778	2.500193	3.415645	n =	47
	within		.2157079	2.240878	4.085436	T =	10
logto~rt	overall	2.434385	1.420259	0	5.204007	N =	469
	between		1.312324	0	4.720701	n =	47
	within		.5784528	.6523501	5.526021	T =	9.97872
logto~uc	overall	5.054202	.4797809	4.043051	7.109879	N =	470
	between		.3798131	4.17446	5.8714	n =	47
	within		.2978254	3.991989	6.292681	T =	10
logedu~m	overall	3.909469	.4772805	2.639057	5.342334	N =	470
	between		.4406926	2.872797	5.110528	n =	47
	within		.1931672	3.202432	5.315396	T =	10
logto~lt	overall	5.461232	.3102295	4.276666	6.421622	N =	470
	between		.28437	4.705169	6.253217	n =	47
	within		.1301071	5.032729	6.020657	T =	10
logto~oc	overall	6.283739	.5483673	4.875197	7.521318	N =	469
	between		.4962275	5.606916	7.422369	n =	47
	within		.2430725	5.445554	6.733004	T-bar =	9.97872
loginc~c	overall	5.103818	.7635969	2.484907	6.73578	N =	470
	between		.694716	3.922015	6.529933	n =	47
	within		.3312272	3.541355	5.852239	T =	10
logsoc~k	overall	3.513023	.6126345	1.94591	5.141664	N =	470
	between		.5568937	2.337348	4.886569	n =	47
	within		.266724	2.597685	4.531374	T =	10
logchi~e	overall	2.529451	.5592089	0	4.29046	N =	466
	between		.5002419	1.221905	3.981495	n =	47
	within		.2800689	.8041249	3.532044	T-bar =	9.91489
logsoc~e	overall	5.938174	.9523304	3.044523	8.203031	N =	469
	between		.8076058	4.424095	7.587023	n =	47
	within		.5158982	3.426124	7.572241	T-bar =	9.97872
logtot~h	overall	5.314384	.2512663	4.158883	5.902633	N =	470
	between		.2294782	4.559858	5.650788	n =	47
	within		.1071684	4.486589	5.690542	T =	10
logyouth	overall	3.143112	.6145364	0	4.85203	N =	469
	between		.3743984	2.149627	4.780593	n =	47
	within		.4898399	.2318282	4.251582	T-bar =	9.97872

Summary Statistics Logged Part 3

logacq~c	overall	-4.785795	1.917491	-9.85917	-1.427495	N =	468
	between		1.913358	-9.422994	-1.55326	n =	47
	within		.3178401	-6.464373	-2.523615	T-bar =	9.95745
logtra~c	overall	-2.822639	.8775548	-4.932812	-1.052235	N =	470
	between		.8702694	-4.76396	-1.142328	n =	47
	within		.1651285	-3.493525	-1.618936	T =	10
logmod~c	overall	-4.274274	.8235504	-6.753438	-2.653097	N =	470
	between		.7845249	-6.353245	-3.068873	n =	47
	within		.2730693	-5.395537	-2.746143	T =	10
logbus~c	overall	-2.037586	.3562823	-2.7754	-.9636339	N =	470
	between		.3472893	-2.619549	-1.010079	n =	47
	within		.0929606	-2.454434	-1.78009	T =	10
logdis~c	overall	-1.825595	.4932233	-3.023438	-.8728142	N =	470
	between		.4862612	-2.774206	-.9417364	n =	47
	within		.1065677	-2.379299	-1.286857	T =	10
logose~c	overall	-1.546985	.2431683	-2.447136	-.8658745	N =	470
	between		.2360578	-2.325186	-.9230569	n =	47
	within		.0669093	-1.754206	-1.25904	T =	10
logspe~c	overall	-3.17249	.5954777	-4.903378	-1.465744	N =	470
	between		.5761259	-4.307948	-1.780918	n =	47
	within		.1704175	-3.76792	-2.603266	T =	10
loggov~c	overall	-1.349238	.3706148	-2.182906	-.4513141	N =	470
	between		.3662586	-1.98448	-.5646995	n =	47
	within		.076054	-1.635589	-1.055007	T =	10
logher~l	overall	-1.538468	.2127176	-1.8842	-.8011597	N =	470
	between		.2109322	-1.822331	-.9413488	n =	47
	within		.0401272	-1.740982	-1.360924	T =	10
logunemp	overall	-3.115759	.2855727	-3.649659	-2.216407	N =	470
	between		.1768876	-3.37631	-2.650113	n =	47
	within		.2255282	-3.589212	-2.670029	T =	10
logtot~p	overall	9.426003	.9706809	7.320527	12.5052	N =	470
	between		.9786509	7.483975	12.46562	n =	47
	within		.0533189	9.189335	9.572901	T =	10
logtot~n	overall	2.649013	.9983893	0	5.135798	N =	468
	between		.8728214	1.046287	4.635027	n =	47
	within		.4997516	.209861	4.418382	T =	9.95745
logemp~t	overall	4.260232	1.139815	0	6.347389	N =	469
	between		.8444905	2.848	6.123096	n =	47
	within		.7739804	.80596	5.985695	T-bar =	9.97872

Unemployment Random effects

```
Random-effects GLS regression                   Number of obs     =       459
Group variable: id                              Number of groups  =        47

R-sq:                                           Obs per group:
     within  = 0.3877                                         min =         7
     between = 0.8526                                         avg =       9.8
     overall = 0.5526                                         max =        10

                                                Wald chi2(28)     =    428.97
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =    0.0000
```

logunemp	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
logtotecon	.0474131	.0155726	3.04	0.002	.0168913	.0779348
logempart	-.0604058	.0159741	-3.78	0.000	-.0917146	-.0290971
logpop1524	.0295288	.1362163	0.22	0.828	-.2374502	.2965078
logpop4564	.2015765	.1916297	1.05	0.293	-.1740108	.5771639
logpopdens	-.0277072	.0286788	-0.97	0.334	-.0839165	.0285022
logwest	-.0891161	.0637596	-1.40	0.162	-.2140825	.0358504
lognwest	.1589663	.0432316	3.68	0.000	.0742339	.2436986
lognwesto	.2048187	.0529825	3.87	0.000	.1009749	.3086626
logpop	-.0299421	.0350728	-0.85	0.393	-.0986834	.0387993
loghhchild	-.3187103	.1603935	-1.99	0.047	-.6330758	-.0043447
loglowinc	.7223032	.254529	2.84	0.005	.2234356	1.221171
loginactivepop	-.5915265	.1482167	-3.99	0.000	-.8820259	-.3010271
logtoteduc	-.0094922	.0275499	-0.34	0.730	-.063489	.0445045
logincsec	.1458488	.0333923	4.37	0.000	.080401	.2112965
logsocwork	-.0365295	.0266189	-1.37	0.170	-.0887016	.0156425
logchildcare	.0026804	.0238294	0.11	0.910	-.0440243	.0493852
logsochouse	-.0230696	.0125937	-1.83	0.067	-.0477527	.0016135
logyouth	.0885069	.0187685	4.72	0.000	.0517214	.1252925
logadmin	-.05596	.0440477	-1.27	0.204	-.1422919	.0303719
logtottransport	.0250946	.0119124	2.11	0.035	.0017466	.0484426
logacqperc	.0149758	.0112243	1.33	0.182	-.0070234	.0369749
logtradperc	.0751014	.0340396	2.21	0.027	.0083851	.1418177
logmodperc	.0186265	.0187129	1.00	0.320	-.0180501	.0553031
logbusservperc	-.0737625	.0568727	-1.30	0.195	-.185231	.0377061
logdistperc	-.0757777	.0526942	-1.44	0.150	-.1790566	.0275011
logoservperc	.098262	.0705959	1.39	0.164	-.0401036	.2366275
loggovtperc	-.0059724	.0846249	-0.07	0.944	-.1718341	.1598894
logherfindahl	.3604249	.15712	2.29	0.022	.0524752	.6683745
_cons	-1.700336	.855913	-1.99	0.047	-3.377894	-.022777
sigma_u	.04555905					
sigma_e	.17367284					
rho	.06438472	(fraction of variance due to u_i)				

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	459	0.2188	0.6956	1.67	0.4335

Hausman Test Results Unemployment

```
. hausman fe re
```

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
logtotecon	.0332397	.0474131	-.0141734	.013626
logempart	-.0468321	-.0604058	.0135737	.0055894
logpop1524	-.2314354	.0295288	-.2609642	.2899434
logpop4564	-1.236799	.2015765	-1.438375	.4197484
logpopdens	1.00678	-.0277072	1.034487	.4267919
logwest	.3889444	-.0891161	.4780604	.1327443
lognwest	.4601222	.1589663	.301156	.0821633
lognwesto	.2597306	.2048187	.0549119	.0416746
logpop	.1372194	-.0299421	.1671615	.3714037
loghhchild	-1.040095	-.3187103	-.7213852	.4045078
loglowinc	.627446	.7223032	-.0948573	.3221508
loginactiv~p	-.3497752	-.5915265	.2417513	.1124344
logtoteduc	.006383	-.0094922	.0158752	.0199096
logincsec	.1210151	.1458488	-.0248337	.0161892
logsocwork	-.0448503	-.0365295	-.0083208	.0222495
logchildcare	-.0333514	.0026804	-.0360318	.0215153
logsochouse	-.0239886	-.0230696	-.0009189	.0110144
logyouth	.0606014	.0885069	-.0279055	.0116936
logadmin	-.122472	-.05596	-.066512	.0159603
logtottran~t	.0413374	.0250946	.0162428	.0110734
logacqperc	.0664322	.0149758	.0514564	.0263259
logtradperc	-.0131928	.0751014	-.0882942	.0610716
logmodperc	.0148597	.0186265	-.0037668	.0332104
logbusserv~c	-.2195808	-.0737625	-.1458184	.1017691
logdistperc	-.1460362	-.0757777	-.0702584	.0882895
logoservperc	.0120277	.098262	-.0862342	.146959
loggovtperc	.1244793	-.0059724	.1304517	.1374802
logherfind~l	.4936102	.3604249	.1331853	.2902392

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Employment Fixed Effects

```
Fixed-effects (within) regression               Number of obs      =       459
Group variable: id                              Number of groups   =        47

R-sq:                                           Obs per group:
     within  = 0.4511                                         min =         7
     between = 0.5865                                         avg =       9.8
     overall = 0.5941                                         max =        10

                                                F(28,384)          =     11.27
corr(u_i, Xb)  = 0.4840                         Prob > F           =    0.0000
```

logtotemp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
logtotecon	-.0130418	.0050239	-2.60	0.010	-.0229197	-.003164
logempart	.0197294	.004109	4.80	0.000	.0116505	.0278083
logpop1524	-.2426918	.0777778	-3.12	0.002	-.3956156	-.0897681
logpop4564	.4794565	.11203	4.28	0.000	.2591876	.6997255
logpopdens	.34521	.1038556	3.32	0.001	.1410131	.5494069
logwest	-.0525721	.0357543	-1.47	0.142	-.1228708	.0177267
lognwest	.0051171	.0225415	0.23	0.821	-.0392032	.0494373
lognwesto	-.0589243	.0163663	-3.60	0.000	-.0911031	-.0267454
logpop	.062309	.0905753	0.69	0.492	-.1157765	.2403946
loghhchild	-.1871682	.1056504	-1.77	0.077	-.394894	.0205575
loglowinc	-.1136891	.0996829	-1.14	0.255	-.3096818	.0823035
loginactivepop	.0682573	.0451684	1.51	0.132	-.020551	.1570655
logtoteduc	-.0120736	.0082528	-1.46	0.144	-.0282998	.0041527
logincsec	-.0273226	.00901	-3.03	0.003	-.0450377	-.0096076
logsocwork	.0121426	.0084232	1.44	0.150	-.0044188	.028704
logchildcare	-.0055358	.0077949	-0.71	0.478	-.0208619	.0097902
logsochouse	-.0065233	.0040621	-1.61	0.109	-.01451	.0014634
logyouth	-.0006876	.0053689	-0.13	0.898	-.0112438	.0098686
logadmin	.0168463	.0113749	1.48	0.139	-.0055185	.0392111
logtottransport	-.002893	.0039488	-0.73	0.464	-.010657	.0048711
logacqperc	-.0038038	.0069485	-0.55	0.584	-.0174655	.009858
logtradperc	.0404322	.0169754	2.38	0.018	.0070558	.0738085
logmodperc	.0166671	.0092552	1.80	0.073	-.0015301	.0348642
logbusservperc	.0328214	.0283054	1.16	0.247	-.0228315	.0884742
logdistperc	.0087267	.0249637	0.35	0.727	-.0403559	.0578093
logoservperc	-.3346286	.0395839	-8.45	0.000	-.412457	-.2568002
loggovtperc	-.0119968	.0391959	-0.31	0.760	-.0890623	.0650687
logherfindahl	.2863002	.080131	3.57	0.000	.1287498	.4438505
_cons	6.159587	1.167535	5.28	0.000	3.864026	8.455148
sigma_u	.71525344					
sigma_e	.04216649					
rho	.99653656	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(46, 384) = 142.55                     Prob > F = 0.0000
```

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	459	0.0000	0.2312	17.96	0.0001

Employment Random Effects

```
Random-effects GLS regression                   Number of obs     =        459
Group variable: id                              Number of groups  =         47

R-sq:                                           Obs per group:
     within  = 0.3439                                         min =          7
     between = 0.9289                                         avg =        9.8
     overall = 0.9271                                         max =         10

                                                Wald chi2(28)     =    1518.67
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

logtotemp	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
logtotecon	-.011781	.0060786	-1.94	0.053	-.0236948	.0001328
logempart	.0183619	.0050748	3.62	0.000	.0084154	.0283083
logpop1524	-.1970143	.0887746	-2.22	0.026	-.3710095	-.0230192
logpop4564	.2205507	.1275422	1.73	0.084	-.0294275	.4705289
logpopdens	.0978489	.0391569	2.50	0.012	.0211028	.174595
logwest	-.0830633	.0391126	-2.12	0.034	-.1597227	-.0064039
lognwest	.0116423	.026377	0.44	0.659	-.0400557	.0633403
lognwesto	-.0746799	.020004	-3.73	0.000	-.1138871	-.0354728
logpop	.9504571	.0454052	20.93	0.000	.8614645	1.03945
loghhchild	-.5189531	.1116414	-4.65	0.000	-.7377662	-.30014
loglowinc	.0136669	.1139181	0.12	0.905	-.2096085	.2369424
loginactivepop	.0433048	.0545023	0.79	0.427	-.0635177	.1501273
logtoteduc	-.0063357	.010211	-0.62	0.535	-.026349	.0136775
logincsec	-.0251679	.011219	-2.24	0.025	-.0471568	-.003179
logsocwork	.0210161	.0103169	2.04	0.042	.0007954	.0412368
logchildcare	-.0065427	.0096495	-0.68	0.498	-.0254555	.01237
logsochouse	-.004045	.0049613	-0.82	0.415	-.0137689	.0056789
logyouth	-.0019897	.006656	-0.30	0.765	-.0150353	.0110559
logadmin	.0129906	.0141737	0.92	0.359	-.0147894	.0407706
logtottransport	.0033549	.0048654	0.69	0.490	-.0061812	.012891
logacqperc	-.0026568	.0081022	-0.33	0.743	-.0185368	.0132232
logtradperc	.0157073	.0195107	0.81	0.421	-.0225329	.0539476
logmodperc	.0183175	.0110344	1.66	0.097	-.0033096	.0399446
logbusservperc	.021935	.033204	0.66	0.509	-.0431435	.0870136
logdistperc	.0143146	.0290276	0.49	0.622	-.0425784	.0712076
logoservperc	-.4403096	.0466246	-9.44	0.000	-.5316921	-.3489272
loggovtperc	-.0711378	.0463892	-1.53	0.125	-.1620589	.0197833
logherfindahl	.2364798	.095144	2.49	0.013	.050001	.4229586
_cons	-2.370068	.6693324	-3.54	0.000	-3.681935	-1.0582
sigma_u	.13472478					
sigma_e	.04216649					
rho	.91078166	(fraction of variance due to u_i)				

```
. sktest residuals
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint adj chi2(2)	joint Prob>chi2
residuals	459	0.0000	0.0173	32.96	0.0000

Hausman Test Employment

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.
                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re       Difference          S.E.
-------------+------------------------------------------------------------
  logtotecon |   -.0130418    -.011781      -.0012609                .
   logempart |    .0197294    .0183619       .0013675                .
  logpop1524 |   -.2426918   -.1970143      -.0456775                .
  logpop4564 |    .4794565    .2205507       .2589058                .
  logpopdens |      .34521    .0978489       .2473611        .0961911
     logwest |   -.0525721   -.0830633       .0304912                .
    lognwest |    .0051171    .0116423      -.0065253                .
   lognwesto |   -.0589243   -.0746799       .0157557                .
      logpop |     .062309    .9504571       -.888148        .0783725
  loghhchild |   -.1871682   -.5189531       .3317849                .
   loglowinc |   -.1136891    .0136669      -.1273561                .
loginactiv~p |    .0682573    .0433048       .0249525                .
  logtoteduc |   -.0120736   -.0063357      -.0057378                .
   logincsec |   -.0273226   -.0251679      -.0021548                .
  logsocwork |    .0121426    .0210161      -.0088735                .
logchildcare |   -.0055358   -.0065427       .0010069                .
 logsochouse |   -.0065233    -.004045      -.0024783                .
    logyouth |   -.0006876   -.0019897       .0013021                .
    logadmin |    .0168463    .0129906       .0038557                .
logtottran~t |    -.002893    .0033549      -.0062478                .
  logacqperc |   -.0038038   -.0026568       -.001147                .
 logtradperc |    .0404322    .0157073       .0247248                .
  logmodperc |    .0166671    .0183175      -.0016504                .
logbusserv~c |    .0328214     .021935       .0108863                .
 logdistperc |    .0087267    .0143146      -.0055879                .
logoservperc |   -.3346286   -.4403096       .1056811                .
 loggovtperc |   -.0119968   -.0711378        .059141                .
logherfind~l |    .2863002    .2364798       .0498204                .
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(28) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =      109.55
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)

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```