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Bachelor Thesis IBEB

Exploring the effects of a child allowance programme in Poland on the unemployment market using a regression discontinuity approach

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1 Introduction

Much research exists on the effects of welfare programmes such as disability insurance (DI) or unemployment benefits on factors such as work incentives, income substitution and so on. In fact, any policy which affects the labour force carries with it a multitude of changes, some of which can only be discovered after the policy has been implemented which is why so much research focuses on effects of such policies years in the future. Policies such as unemployment insurance generally require the beneficiaries to stay unemployed in order to receive the benefit as well as fulfil a myriad of other conditions which disincentivise them from staying unemployed for long periods of time. Research also supports a strong substitution effect in the welfare market, where loss of income from one programme can be substituted by income from one or more other programmes (Borghans, Gielen, & Luttmer, 2014).

This paper will focus on the effects of a family support programme on work incentives and income, specifically on the unemployment market. In 2015 a new policy was proposed by the ruling right-wing government in Poland, which would offer a fixed sum PLN 500 (Polish zloty)[1] benefit for every second and consecutive child in a family without income requirements as well as to single child families under a certain per person income threshold. The policy was dubbed the "Family 500+" programme and was put into law in February of 2016 (voted in by the parliamentary majority governing party). First payments were delivered in April 2016 and the programme has grown over the years. Just recently it was announced that starting in July 2019 there would be no maximum income condition for receiving the benefit, which is a huge change and an opportunity for further research in and of itself. The programme was highly controversial and dismissed as unaffordable by opposition parties. This paper will investigate how the introduction of the programme affected the labour force, specifically the unemployed with a focus on multiple social groups.

In order to investigate the 500+ programme I exploit a theorised regression discontinuity. In this case it would not be realistically feasible to estimate the effect using a basic OLS approach as there are too many unsobervable and observable factors which can affect the labour market on a county level, and data availability is limited. Due to the rapid introduction of the policy I expect to find a significant decrease in the number of registered unemployed the effect of

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[1]circa 118 EUR on July 1st 2019

which will likely be strongly gendered. Due to the reform the amount of social assistance to Polish families is said to have doubled which can lead to significant changes in the unemployment market (Myck, 2016). The first effect at play here is the substitution effect of income from unemployment insurance with the income from the family programme, which can be considered 'cheaper' in terms of effort costs and/or security. Secondly, as there are conditions to receiving the benefit in the case of one child families the loss of unemployment benefits will be an easy way of making sure conditions are met which introduces an additional income effect. It is likely that at least a section of the beneficiaries will attempt to gain unofficial income which would enable them to obtain an even higher total income than before. Lastly, the income effect means that families can retain their normal level of income while giving up the unemployment benefit, which requires more effort and is less certain in the long term. The challenge here is that there are clear trends in unemployment data, which make it more difficult to estimate the effect of a programme such as this one.

An important aspect of welfare programmes such as this one is that their recipients are generally less well-off and thus more susceptible to the effects mentioned above. Those for whom the additional income makes a big difference may be more prone to react to the change by e.g. resigning from unemployment status or working fewer hours in total, which forms the basis for my hypothesis. Social situation is also likely to play a role in deciding the final effect of a policy. For example, a single mother may be more likely to substitute some of the income from labour or an unemployment insurance scheme, which should be reflected in the data. Much literature exists on the effect of such policies on women's labour market participation and employment, which will be discussed in the literature section. Other factors such as where one lives also play a part in determining the effect of a policy such as 500+, which is why I also estimate the effect for the rural population.

It is also important to define some key terms. Unemployment in Poland is classified based on a few conditions. The person must: (a) be older than 18 years old, (b) be younger than retirement age, (c) have no right to DI or pension, (d) not be an owner of farmland more than 2 hectares in size, (e) not be disabled to the extent that it would prevent them from working even half-time, (f) not be temporarily arrested or serving jail time, (g) not receive monthly income which exceeds half the minimum wage, (h) not receive other benefits related to the

inability to work.[2] The specific requirements and goals of the programme will be discussed in the following section.
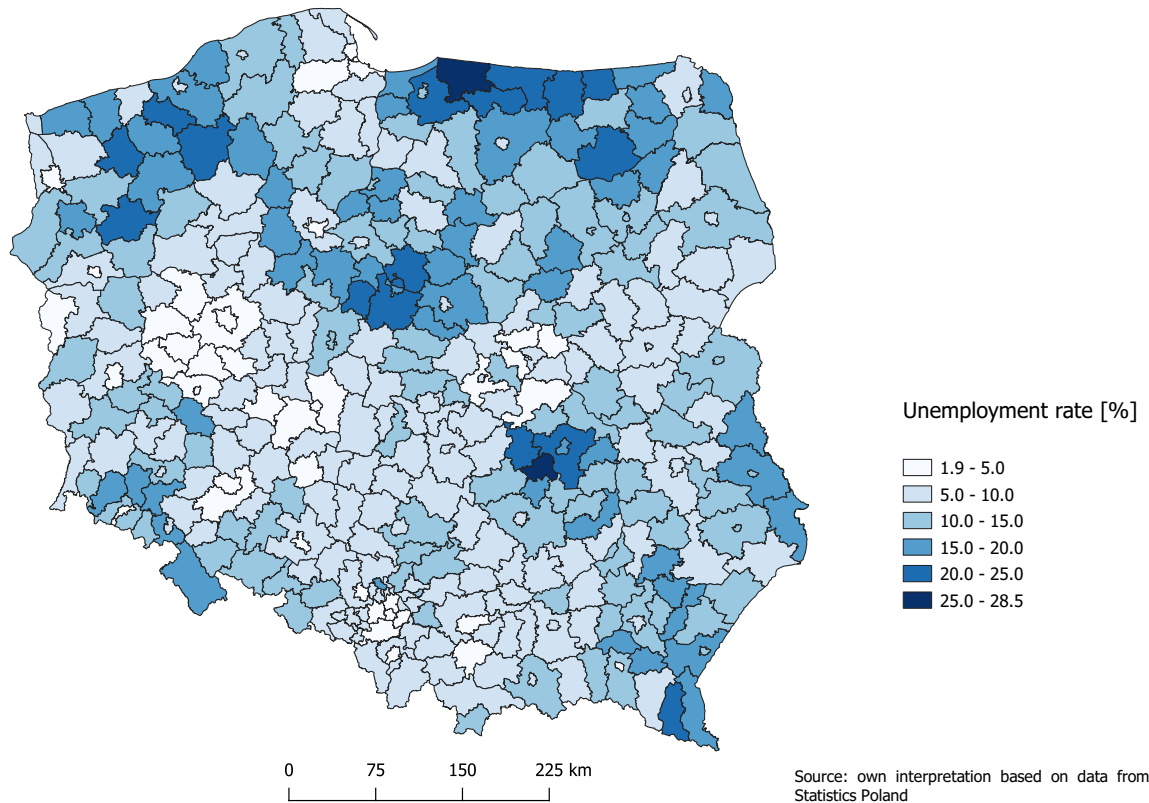

Figure 1: Unemployment rate in Poland in 2016 by county. The lowest value is only 1.9% whereas the highest is 28.5% which is a significant difference.

2   The programme

The 500+ programme dates back to 2014 where it appeared in the party's official election programme. Initially there was no intended income condition, however this was revised and a maximum per-person income condition was implemented in case of one child families. Second and following children in a family would be entitled to the grant irrespective of the family income. One of the long term goals was to promote child birth as a means of remedying the ageing population problem as well as preventing excessive strain of the pension scheme in

[2]These are called 'permanent benefit' and 'social rent,' which are awarded to people unable to work depending on their situation. Similar to DI.

the future. The fertility rate in Poland was the second lowest in the EU in the year preceding the introduction of the programme whereas data shows a 13-15% increase in childbirth in December 2016 and January 2017 (European Commission, 2018). As mentioned, the programme was put into law in February of 2016 with applications and transfers beginning in April. This information is important for determining the exact methodology of the paper. The regression discontinuity is most likely to occur in April of 2016 as there is a clear institutional process taking place, which will likely affect people's behaviour.

According to the government, 40% of all applications were submitted in the first four days of the programme as well as 78% by the end of April. This reassures me that any effect on unemployment would be most visible in this time period as people are reacting to the new government programme. According to a government report from the first three months of the programme 2.23 million decisions were made regarding eligibility and PLN 4.89 billion was already paid to families. The most applications were made in the cities of Warsaw, Kraków, Łódź and Wrocław. It is unsurprising that most the regions with the highest percentage of children covered by the programme are also those with the highest unemployment rates, which results from the income requirement for one child families (Ministry of Family, Labour and Social Policy, 2018a). The 2018 report states that 54.1% of all children in Poland under the age of 18 are covered by the programme– "over 3.74 million (Ministry of Family, Labour and Social Policy, 2018b)." Overall, the programme can be called universal as was its goal but it is worth mentioning that the point of this paper is not to evaluate the programme's effectiveness, but to present evidence for a possible effect on the labour market, specifically on the unemployed and UI withdrawal as a result of the reform.

3   Literature overview

Social programmes are an important subject of research within economics and thus much literature has been published on their impact on society, the economy and on each other. As this paper deals mainly with a family/child support programme and, indirectly, with unemployment insurance, I will present a brief overview of research pertaining to my research question. Firstly, I will look at income substitution between different social programmes with

a focus on unemployment insurance as it directly relates to the effect I am analysing. Next, I will look into child allowance or other programmes specifically in order to build a critical understanding of their effects on employment and other factors. Lastly, I will look at three studies from Poland which specifically look at the 500+ programme and its effects.

In their 2014 paper on the disability insurance reform in the Netherlands, Borghans et al. found evidence of substitution in social support programmes, namely lost DI benefits could be offset by collecting more income from other programmes— EUR 0.30 for every EUR 1.00 lost, an effect which decreases over time. This is consistent with my hypothesis which predicts that willingly lost income from unemployment insurance can be offset by collecting income from the new family support programme. It is unclear however, whether this effect would also decline over time or whether the nature of the universality of the programme would result in a constant effect over time. The paper also shows that there is an earnings rebound of lost DI income, which they claim is evidence of spare earnings capacity among the 'long-term claimants' of disability insurance which is not directly relevant to my paper but suggests that spare earnings capacity could have an effect on the earnings rebound effect. Koning and van Vuuren (2010) also looked at the Netherlands DI reform and were also able to estimate the degree of earnings substitution between UI and DI. Their study of firms in the Netherlands between 1993 and 2002 found that '3% of all dismissals took place through DI' which they think suggests hidden unemployment that they claim to be 'one quarter of the DI enrolments' in the sample. However, they find no evidence for substitution of DI claimants into UI which contradicts the paper by Borghans et al who found that lost DI income was offset by earnings from other programmes such as UI. It is worth noting that the methodology of both papers was different and perhaps the firm data used in the 2010 paper could not estimate earnings substitution as the 2014 paper did with individual data. Autor, Kostol, Mogstad, and Setzler (2017) find that 'denial' from DI scheme causes a 'significant drop in household income and consumption on average.' In the case of married appellants, however, they find that spousal earnings and benefit substitution from other programmes counteract the effect of the DI denial. This is consistent with 2014 paper and my hypothesis and would suggest that the receipt of the family programme coupled with spousal earnings would counteract a withdrawal from an UI scheme and thus could decrease the overall UI enrolment in the country. Overall, all three papers discussed support the notion that there is income substitution between social

programmes but differ in their approach and conclusions.

Scharle (2007) investigates the effects of welfare programmes on the female labour supply specifically in Central and Eastern Europe with Poland being a part of the sample. The paper states that the female labour participation was significantly higher under socialism but that 'traditional attitudes to male and female roles survived and are apparent in the division of work in the household' which is closely related to the 500+ programme and its potential effect on female participation due to motherhood, child care, etc. Admittedly much has changed since 2007 when the paper was published, nevertheless these effects cannot be ignored. The author states that public provision of day care promotes female participation in the labour market as expected but that cash benefits decrease it with a 'considerably stronger' effect in new member states at the time.[3] This is consistent with my hypothesis and suggests that female participation should decrease due to more benefits. She also recommends a restructuring of existing benefits in order to provide better income protection and better work incentives for mothers. The next paper by Haan and Wrohlich (2011) investigates the effects of child care programmes such as subsidies on female employment and fertility, which are both relevant factors to this paper. The empirical analysis is based on socio-economic panel data from Germany, with an East/West division. The authors find a significant positive effect of household income on fertility and employment, which suggests that the 500+ programme could potentially increase employment too, due to higher household income on average. However, consistent with the 2007 paper, they also find negative employment effects of a universal child benefits scheme which is consistent with my hypothesis. Overall, they suggest unconditional childcare subsidies for working mothers, which they find promote both fertility as well as female employment. Both papers reaffirm the notion that programmes aimed at fertility and female labour participation are necessary, however child benefit programmes or other welfare schemes lead to higher female unemployment, which is undesirable. The consensus seems to be that the preferable policy is childcare subsidies/public provision, which help avoid the undesirable workforce participation effects.

Next, I will look at three studies conducted in Poland following the introduction of the 500+

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[3]Countries featured in the paper: Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia, Slovak Republic

programme. The first one is a working paper from the Institute for Structural Research (IBS) which focuses on the impact of the new programme on the female labour supply (Magda, Kiełczewska, & Brandt, 2018). The authors use Polish Labour Force Survey data and differentiate between single and partnered women[4] with a 6% higher labour market participation in the former group before the programme was introduced. The impact on the female labour market post-reform is estimated at 2.5% for labour market participation and 3% for employment in mid-2017, which is consistent with other literature mentioned in this section. The authors also reveal that this effect is strongest for lowest educated mothers, which is likely a result of lower expected income from labour as well as fewer opportunities, which emphasises the income and substitution effects. The following paper comes from the University of Warsaw and looks at the projected impact of the 500+ programme on household income, poverty and inequality using 2015 data.(Brzeziński & Najsztub, 2017) The authors use household budget data from the Central Statistical Office of Poland and estimate the short-term impact of the programme. They find that the biggest impact on household income would be seen in the lower portion of the distribution. Child poverty would decrease by 75-100% and the Gini-coefficient inequality would decrease by 'a few percent.' Despite limited relevance to my research question the paper suggests that based on projections the overall impact of the 500+ programme would be positive in key areas such as poverty and inequality, which are among its goals. Lastly, a paper by Myck (2016) looks at the labour market effects of the programme, which is of key relevance to my paper. The approach here uses a discrete choice labour supply model in order to simulate the 500+ reform as well as Polish Household Budget Survey (PHBS) data between 2011 and 2013. The results suggest a labour market withdrawal of 235,000 individuals with the bulk of the effect concentrated among 'women (230,000), in families with one or two children and among those living in small towns and villages.' Additionally 25,000 single parents would be expected to exit the labour market according to the author. Overall, the paper also suggests that the material situation of many households was greatly improved due to the programme. Overall, the above studies seem consistent in the fact that labour supply and employment were negatively impacted by the reform, especially among women, which I will attempt to reaffirm with my estimations. Despite a negative impact on the labour market the studies suggest an improvement in the material situation of households as well as lower child poverty, which is consistent with the programme's main

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[4]"women living with a spouse or cohabiting partner in the same household"

aims and goals.

The above literature suggests that there is a strong effect of child programmes such as child allowance and other cash transfers on the labour market, especially among women. The goal of this paper is to build on this literature and investigate the labour market effects in other social groups, not only women as well as to provide a localised perspective of a child allowance reform in a Central European country.

4   Data

For this paper I use data published by the Ministry of Family, Labour and Social Policy between 2012 and 2019. The specific data set is quite extensive and comes from regional unemployment offices at the county level which are obligated to publish their data in a standardised manner. There are 314 land counties in Poland as well as 66 city counties as of 2019, nearly 400 in total. There are no notable changes in the administrative division in the period of interest other than one city regaining county status in 2013. Therefore, the data set is balanced regarding the unemployment data.

The format of the data as well as the relevant categories are identical for all counties in a given year, however there are small changes between years. To deal with this I extract only the overlapping categories and only use those in my analysis. The specific form (in Polish) can be found in the appendix. The main sections of the form are based on various classifications of unemployed such as their individual characteristics (age, work experience, education), reasons for being unemployed and reasons for exclusion from the unemployment registry. These categories combined with a solid data set of regional data enable me to select the most appropriate categories related to the 500+ programme. On the other hand I can exclude some obvious categories which would not qualify. An added feature of the data set is that city counties are accounted for separately. This enables me to compare the unemployment structure between cities and rural areas. I expect the effect of the programme to be stronger outside of cities where childbirth rates are normally higher.

A challenging aspect of working with the unemployment data is that there is a clear downward trend beginning in 2015 which needs to be accounted for if unbiased estimates are to be obtained. Looking at the data from 2012 to 2019, there is an upwards trend between 2012 and 2013 with a downwards trend from 2014 onwards. The data appears in monthly intervals, however there is significant variation within the year. Usually the peak unemployment occurs in February and the lowest values are found in October based on means. There is also quite a lot of variation between individual counties, which is expected. Certain areas in Poland experience very high unemployment of up to 30% whereas others have unemployment in the 0-5% bracket. The data is presented as absolute number of people in each category, without proportions of the overall population. Additionally, I chose to collect population data per county in order to allow me to calculate proportions if required as well as to clearly see the differences in the relative unemployment between counties. The population data I have gathered only includes yearly data, however this is not a big problem as yearly fluctuations are small whereas differences between county populations are quite substantial. The small error resulting from not using monthly data is unlikely to have a significant effect on the final result.

In order to provide a comprehensive analysis, I use a few different social groups for my estimations. Firstly, I include the number of unemployed registered in the given month[5]. While this does not accurately represent the unemployment *rate* which is based on the total workforce, it is sufficient to show the effect on the unemployment market. People will register as unemployed if their situation forces them to do so. If they end up receiving a benefit from a different social programme (such as 500+) they might end up not entering the unemployment status at all, therefore decreasing the number of total sign-ups. If I chose to use the total number of unemployed in a given month this would increase some noise into the data as some long-term unemployed from before the programme would affect my variables. Because I only estimate new sign ups, which I expect to decrease, I only take into account the exact period I am estimating.

The second group I use is those who live in rural areas.[6] This enables me to compare the overall unemployment market to that in rural areas by looking at how their proportion changes

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[5]Row 01 in the form

[6]Row 05

within the overall number registrations. I base this on the fact that rural areas generally have higher unemployment as well as higher birthrates, which are both important factors in my estimations. According to the Polish statistical office, there was a birthrate of 10.2 births per 1000 inhabitants in rural areas in 2016 compared to 9.8 in cities. The fertility was also higher in rural areas– 1.39 versus 1.33. The unemployment was also significantly higher in rural areas, which is actually a relatively recent trend. Whereas the unemployment rate was higher in cities from the 1990s throughout the 2000s, it has since reversed and in 2016 it was equal to 5.9% in cities and 6.5% in rural areas. It is worth noting that this disparity is quite small compared to the past figures (difference of nearly 4% in 2002).

The third group is women[7]. Whereas the unemployment rates are quite similar for men and women (6.1% and 6.2% respectively in 2016) it is still common for women in Central Europe to not take up employment after giving birth if the economic situation allows it (see: Scharle, 2007). Here, I expect to find a significant negative effect on the share of women in the overall number of registrations. This would be in line with some of the programme's goals (increasing birthrates, supporting the family unit, etc.) and it would make sense from the income effect point of view.

Finally, I include those who voluntarily resigned from their unemployment status as my fourth group.[8] Above, I mentioned the income and substitution effects of the programme which will both have an effect on people's decision to become and remain unemployed. Based on my hypothesis I expect this number to rise due to the introduction of the programme due the the income effect as well as the substitution effect taking place. I expect that as the family income increases due to the programme, more people will opt out of unemployment benefits, therefore substituting that income with the new programme. Similarly, they could put less effort into maintaining unemployment status, instead opting to keep the same income as before at a lower marginal cost. The summary statistics are presented below. The 'total' variable refers to the total number of registered unemployed in a given month whereas the 'overall' variable are the overall people who acquired unemployment status in a given month. The other categories are subsets of the 'overall' variable.

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[7]Row 11, column 2

[8]Row 60

	Obs	Mean	Std. Dev.	Min	Max
Total Unemployed	28500	4041.478	3613.025	331	56088
Population	28500	101225.9	117527.5	20270	1764615
Overall number of registrations	28500	473.2336	357.5432	54	5830
Proportion of rural population	28500	0.4823051	0.2704551	0	1
Proportion of women	28500	0.4881353	0.0525321	0.1934156	0.73057
Number of resignations	28500	33.14726	27.24116	0	332

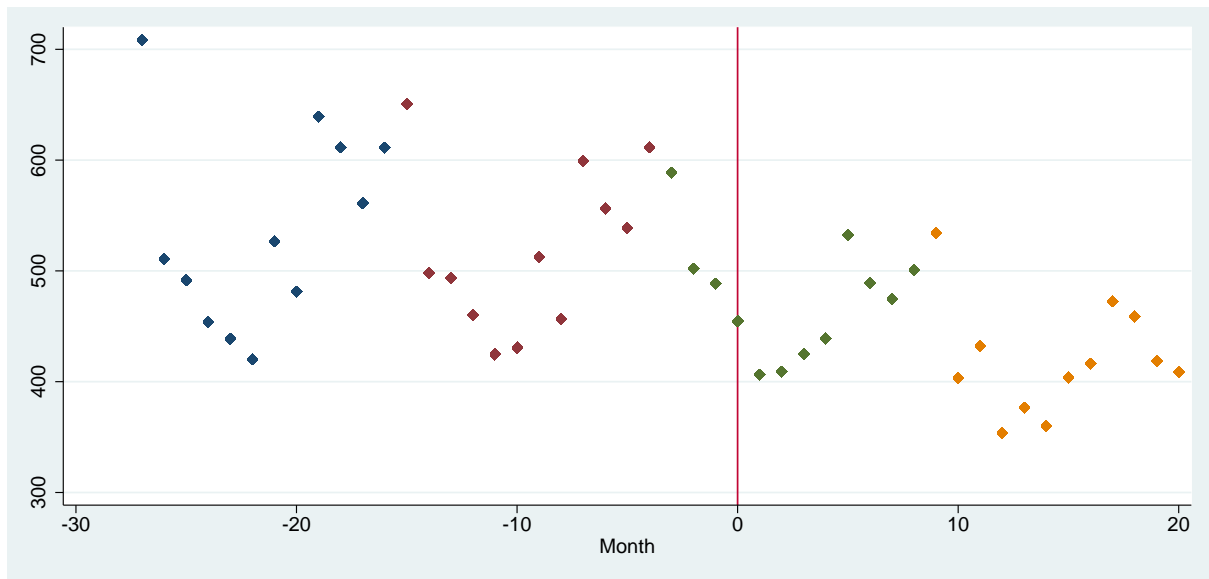Table 1: Summary statistics. Data used is between February 2013 and April 2019.

Figure 2: Means of new registrations per month colour coded by year. The graph shows significant within-year variation.

As can be seen on the graph, the within-year variation in the data is quite high, which can pose several problems. Because there is already some variation around the threshold, it might not be possible to estimate the local treatment effect using a narrow window around the discontinuity as the effect would be distorted by within-year variations. Additionally, my goal was to preserve the sample size and refrain from using means and such in order to estimate the model. I also chose not to standardise the data in any way, because it is simply not necessary. It is a fact that some counties will have proportionally larger amounts of unemployed than others, which is an important aspect of the intra-regional variation in Poland. Non-standardised values will give an overall average effect per county which can then be used to calculate the proportion of unemployed in the given category based on the total population. It is also possible to estimate the aggregate effect on the province or national level. Due to

the downwards trend in the data, it is also important to include a trend variable. Without accounting for that the effect of the programme would likely be overestimated.

5 Methodology

In order to estimate the effects of the programme on the unemployment market I exploit a regression discontinuity in the data, which I believe occurred in April of 2016. Due to the limitations of the data set, which does not include those who signed up to the programme or intended to sign up as well as those with children and those without, there are possibly two other effects at play here, which would result in a biased estimate at the April threshold. Firstly, there is a possible anticipation effect around February 2016, because that is when the programme was passed by the parliament, which could start affecting the labour market straight away. Because of this, some of those which would change their behaviour in April would have done so in February, thus diminishing the effect in April. The second effect would be a fertility effect, namely those who had only one child which did not qualify them for the programme or those without children but meeting the income requirement could potentially be affected only nine or so months later (the length of the average pregnancy), around January 2017 due to having a child.

5.1 The model

In order to estimate the LATE at the threshold a few different models can be used. Firstly, I must decide whether a linear model is suitable or whether I must use a higher order polynomial to fit the data points. The underlying macro trend is the unemployment rate, which I can calculate using my data. I take the number of unemployed at the end of April every year (for consistency with my chosen data set) and divide it by the population for each county. I then plot the means against a linear estimation. As the unemployment seems to closely resemble a linear trend and can be estimated using a linear model I do not need to use higher order polynomials, especially because I've eliminated the within-year variations already with the choice of estimation windows.
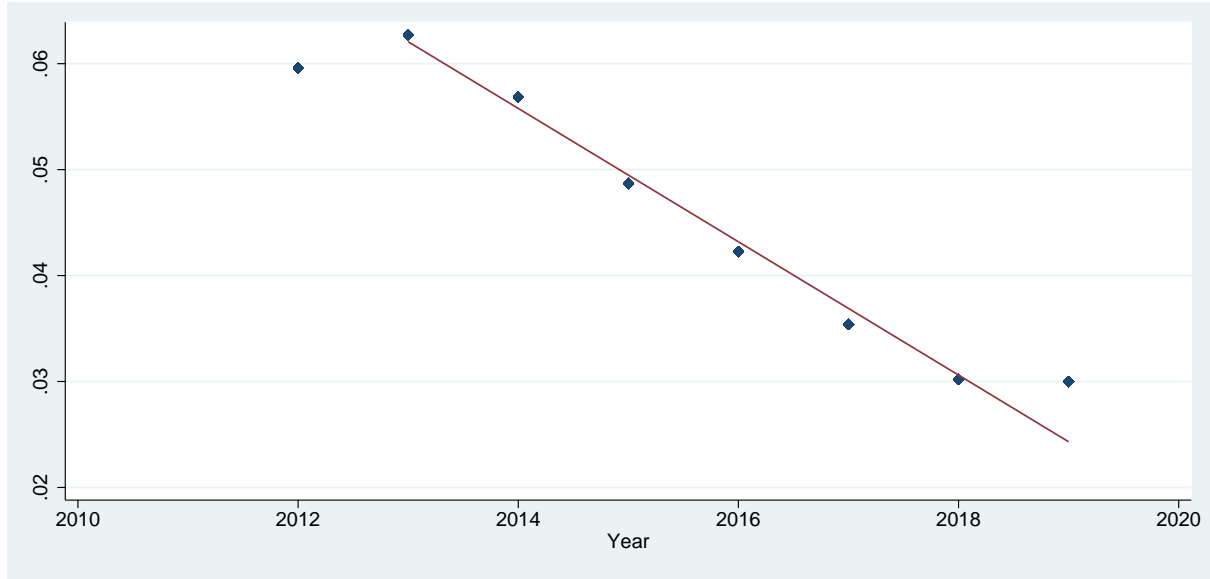
Figure 3: Mean unemployment rate per year based on total number of unemployed in a given month and the yearly population of each county. The trend for relevant years (2013-2019) can be estimated linearly.

Firstly, I use a sharp RD model with the group variable as the number of unemployed corresponding to one of the 5 categories as the variable of interest. The approach here is non-parametric and is based on linear estimations around the threshold which the model reflects. In order to use the sharp RD approach I need to use the dummy for the 500+ programme as a regressor which in this case indicates whether the programme has been fully rolled out or not. It is therefore equal to 1 from April 2016 onwards and 0 otherwise. Additionally I include the trend variable in my model. This serves two purposes, firstly it accounts for the underlying trend, which I have found to be linear and secondly it ensures that the RD is more than just a with-and-without comparison by including the running variable as a regressor. The final results include estimations with and without the trend variable for comparison.

$$y_{it} = \beta_0 + \tau D + \gamma T + \epsilon_{it} \tag{1}$$

where

$$D = \begin{cases} 0, & \text{if } t < 0 \\ 1, & \text{otherwise} \end{cases} \tag{2}$$

Here the y_{it} represents the variable of interest for county i at time t which is based on my

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5 selected categories within the unemployment data. τ is the coefficient for the programme dummy D, which is equal to 0 before April 2016. It is worth noting that the threshold is set to period 0 which means that periods before the introduction of the programme have a negative time value. The data is monthly so t represents the month before or after the threshold. γ represents the coefficient for T which is my running variable. This is used to account for the underlying unemployment trend. ϵ_{it} represents the error term.

In order to successfully estimate the LATE at the threshold it is important to select the right window of observations around the threshold in which the estimation is performed. This choice is ultimately a trade-off between internal and external validity. A too large window can result in a biased estimate as long term trends could decrease the accuracy of the trend at the cutoff point, decreasing internal validity, however could increase external validity due to a larger sample size. On the other hand, using too small a window can result in biased estimates as well, as it may not be representative of the overall sample and thus have a lower external validity. On the other hand the internal validity may be higher due to more focus being placed on the values immediately around the threshold. For the purpose of this paper I estimate three different windows around the threshold[9]: 1 year, 2 years and 3 years. This gives me a flexible framework to carry out the estimations without over-complicating the results. As mentioned above I decided to use a minimum of 1 year window before and after the threshold as within-year variation would distort the results. Overall this option is more realistic based on the data and should give more convincing results. Unfortunately, a limitation of the data set as described in the previous sections is that the exact treatment effect at the threshold is difficult to estimate, but instead focusing on a more general and structural change in the labour market like is done here with the larger windows is preferable.

5.2 Anticipation effects

Despite the fact that the programme was fully rolled out in April of 2016, it was announced in the party programme many months before and finally approved by the parliament in February of 2016. This would likely start to have an effect on the registered unemployed due to anticipation effects as the prospect of additional income in the future became more certain.

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[9]values refer to the window before and after the threshold, not the total window which is a sum of the two

Because of this effect I will additionally estimate the effect using a threshold set before April. The best option here is to use February as the effect would be the strongest then. Due to the nature of the trends in the variables this estimation cannot be performed using a small window around the threshold which is why later values from when the programme was operational will affect this estimation. Nevertheless, it is an interesting exercise to compare the coefficients from this estimation with the ones from April.

5.3   Child birth effects

The major goal of many child benefit policies which was talked about in the literature section is to improve the fertility rate, which has reached alarmingly low levels in many countries including Poland. 500+ is no different and one of its goals from the start was to help increase the fertility rate in the country. The rationale behind it is that those who perhaps wanted to have (more) children could not due to their economic situation or uncertainty. Also, those who did not consider having a(nother) child would have reconsidered if they could receive a substantial monthly benefit because of it. Because of this the effect of child birth due to the introduction of the programme should be taken into account. I will estimate the effect of the programme at a different threshold at a point in which the effect of child births due to the programme would come into effect. As the average human pregnancy lasts 9 months I will set this new threshold in January 2017, 9 months after the original one in order to estimate the coefficient with the child birth effect. This date is somewhat arbitrary as it is uncertain when most of the pregnancies would start. What is certain, however is that the existence of the effect is highly likely and an increase in fertility was already shown in other studies. The problem of within-year variation is still the case for these estimations, but the results should point to small but significant effect due to the child birth effect. Here, only the sharp RD approach can be used as it would not be possible to estimate the proportion of new child births in the group of registered unemployed.

6 Results

Initially looking at the graph there seems to be a clear change in the time series around April 2016. The x-axis is centred around the threshold and represents the distance in months from 0 to the respective month the measurement is from. The y-axis represents the number of people in each category in the given county. Whereas the trend lines are fitted using the whole sample, the data points are illustrated using mean values for clarity. The spread of the data points seems to be tighter and prominently more downward sloping for the overall category after the threshold. Only the largest window is graphed but for 1 and 2 year windows the jump is even more pronounced. Graphs for other categories can be found in the Appendix.
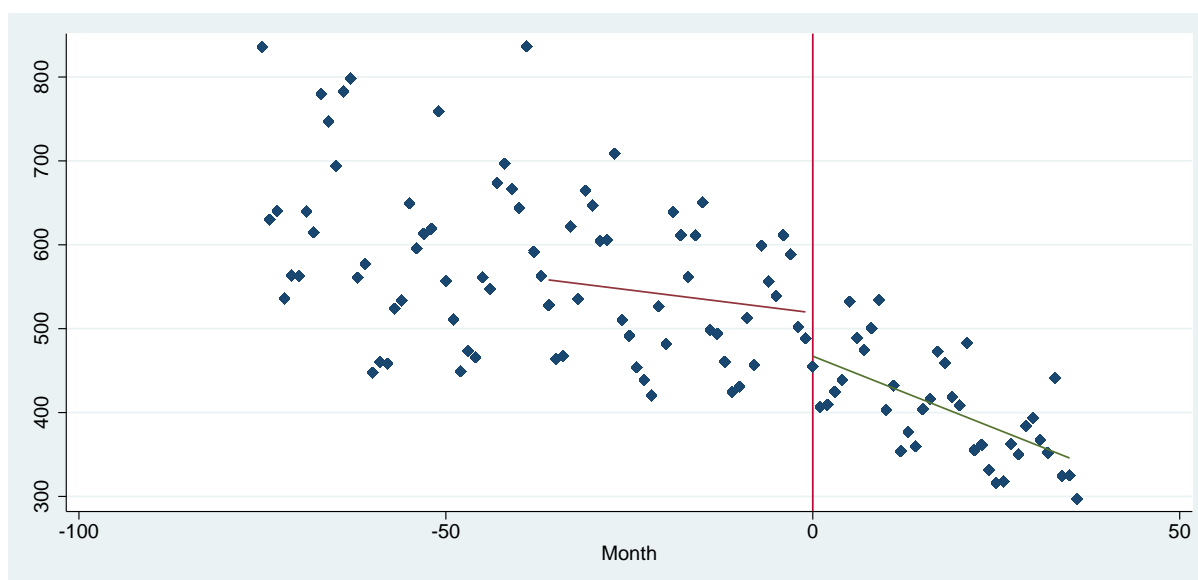

Figure 4: Number of overall new registrations per month. Trend lines are estimated over 3 year windows before and after the threshold.

The table below shows the sharp RD results of the regressions and includes coefficients for all three windows around the threshold as well as with and without the trend variable separately. As can be seen, most coefficients are significant at the 1% level. Looking at the category for overall UI participation we can see that when accounting for the trend the largest effect is seen for the 1 year window at 136.50 fewer enrolments after April 2016 than before on average per county. Looking at the 3 year window, however, the number is equal to -50.46, less than half of the 1 year one. Taking the mean population of a county in the sample from the descriptive statistics table at 101222.1, this number is equal to around 0.05% of the population on average. Looking at the rural population, there seems to be a decrease in its proportion in the overall

unemployment group with 0.5% increase based on the 1 year window and a 0.19% decrease for the 3 year window. It does seem that the response to the reform in rural communities was relatively smaller than in cities. Looking at the proportion of women it has significantly increased, ranging from 2.59% to 0.65%. The effect is likely based on the fact that women tend to work less in response to child benefits as is documented in literature. Therefore, the effect of the programme has increased the proportion of women among the unemployed which is opposite to the general trend which sees a decrease in registered unemployed. Consistent with previous results the number of resignations from unemployment status increased, ranging from 9.53 persons per county on average to 3.53 persons. It should be mentioned that the model without the trend variable shows increasingly negative values, up to -3.56.

	1 year		2 years		3 years	
Overall number of registrations	-55.75***	-136.50***	-91.14***	-78.86***	-132.54***	-50.46***
	(2.09)	(4.35)	(3.75)	(2.47)	(5.56)	(1.89)
Proportion of rural population	0.000960*	-0.00510***	0.000986*	-0.00224***	0.00174***	-0.00189***
	(0.000539)	(0.00107)	(0.000539)	(0.000756)	(0.000605)	(0.000649)
Proportion of women	0.00142**	0.0259***	0.00728***	0.0111***	0.0138***	0.00652***
	(0.000647)	(0.00165)	(0.000627)	(0.00104)	(0.000718)	(0.000832)
Number of resignations	1.20***	9.53***	-2.92***	8.67***	-3.56***	3.53***
	(0.419)	(0.767)	(0.404)	(0.610)	(0.440)	(0.508)
Trend variable	No	Yes	No	Yes	No	Yes
Number of observations	9120	9120	18240	18240	27360	27360

Table 2: Sharp RD results at April 2016 threshold for +/- 1,2,3 years. Standard errors are clustered at county level and shown in the parentheses.

The following results are for the anticipation effect with the threshold set at February 2016. The coefficients for the overall number of registrations are slightly larger, suggesting that there might be an anticipation effect and observations directly before the programme's introduction were already affected. This is especially evident for the small window of 1 year which could not be affected by new values 3 years before or after the threshold. The coefficients for the proportion of rural population are also larger (more negative). The coefficients for the proportion of women are noticeably smaller suggesting some kind of effect around the original threshold. For the number of resignations, the results are similar as before with small changes to the coefficients. Overall it seems that there are some anticipation effects which can be seen in how the coefficients change when moving the threshold 2 months back to February. The precise cause of these differences is unclear, but change varies by category.

	1 year		2 years		3 years	
Overall number of registrations	-45.03***	-146.19***	-82.74***	-94.08***	-129.74***	-55.53***
	(2.23)	(4.18)	(3.75)	(2.77)	(5.66)	(2.05)
Proportion of rural population	0.00262***	-0.00741***	0.00193***	-0.00404***	0.00247***	-0.00334***
	(0.000560)	(0.00106)	(0.000540)	(0.000752)	(0.000615)	(0.000661)
Proportion of women	0.00678***	0.0138***	0.0100***	0.00533***	0.0158***	0.00243***
	(0.000664)	(0.00151)	(0.000643)	(0.000989)	(0.000715)	(0.000849)
Number of resignations	0.142	10.57***	-2.64***	7.91***	-3.15***	2.59***
	(0.409)	(0.747)	(0.399)	(0.612)	(0.435)	(0.508)
Trend variable	No	Yes	No	Yes	No	Yes
Number of observations	9120	9120	18240	18240	27360	27360

Table 3: Sharp RD results at February 2016 threshold for +/- 1,2,3 years. Standard errors are clustered at county level and shown in the parentheses.
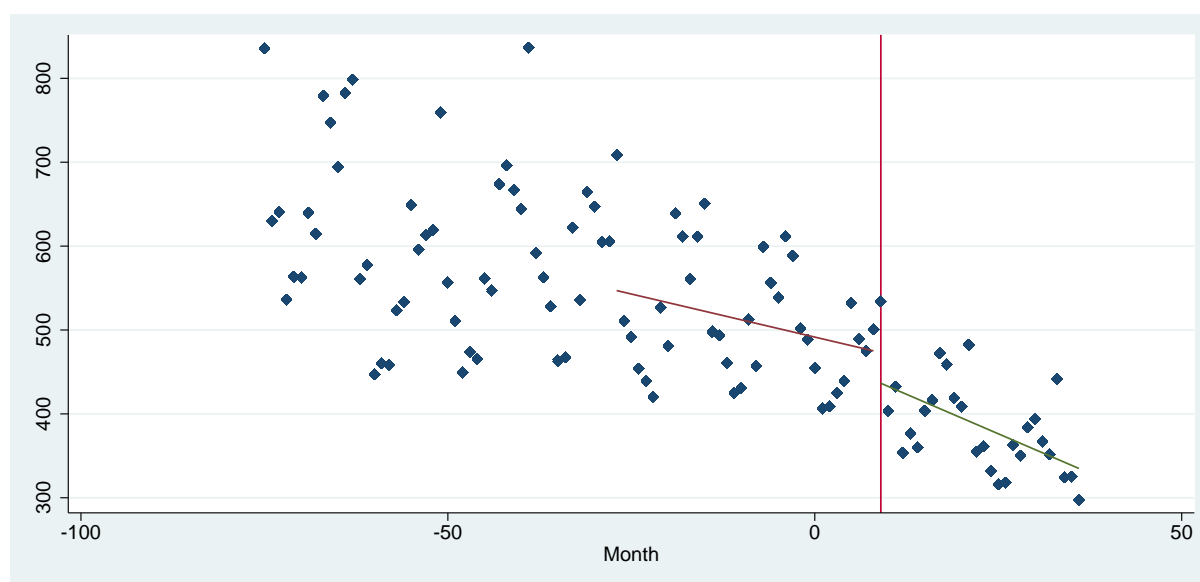

Figure 5: Number of overall new registrations per month with +9 months threshold to test for child birth effects.

Figure 5 shows the number of overall registrations with the threshold shifted +9 months. The jump is less pronounced and the slopes of the trend lines are more similar than with the original threshold. Table 4 includes the coefficients of the estimations of the child birth effects. The coefficients are significantly smaller for the overall category. For 1 year windows the coefficient is smaller by 100, whereas the 3 year estimate is also smaller, although by less than 10. For the rural population the coefficients are larger (more negative) which suggests some differences between rural and city populations in terms of possible child birth effects or delayed participation. For women the effect seems to be reversed, instead of a small positive effect on the proportion of women in unemployment there is now a small negative effect.

This could be caused by the fact that due to the child birth effects women choose to opt out of unemployment benefits in general as opposed to working less. The effects for the number of resignations are generally similar, some coefficients increase whereas others decrease, but not by significant amounts.

	1 year		2 years		3 years	
Overall number of registrations	-55.93***	-34.94***	-105.45***	-28.67***	-125.33***	-42.14***
	(2.31)	(3.43)	(4.01)	(2.03)	(4.99)	(1.93)
Proportion of rural population	-0.000619	-0.0133***	0.000187	-0.00785***	0.000216	-0.00563***
	(0.000583)	(0.00133)	(0.000560)	(0.000879)	(0.000575)	(0.000763)
Proportion of women	0.00398***	-0.0247***	0.0106***	-0.0149***	0.0110***	-0.00750***
	(0.000750)	(0.00167)	(0.000713)	(0.00109)	(0.000728)	(0.000928)
Number of resignations	-2.63***	12.06***	-4.64***	5.39***	-5.47***	2.52***
	(0.335)	(0.672)	(0.394)	(0.436)	(0.410)	(0.427)
Trend variable	No	Yes	No	Yes	No	Yes
Number of observations	9120	9120	18240	18240	24320	24320

Table 4: Sharp RD results at January 2017 threshold for +/- 1,2,3 years. Standard errors are clustered at county level and shown in the parentheses.

7 Conclusion

In this paper I showed that a child benefits programme can have an effect on the labour market through substitution effects with other programmes as well as income effects which result in overall less participation in unemployment insurance. Coefficients up to -136.5 fewer registrations per county per month were noted which translates to 0.13% of the population. The coefficients for 2 and 3 year windows are significantly smaller. Significant coefficients were found for the proportion of rural population in unemployment with up to -0.5% increases with 1 year estimation windows. For the proportion of women, the effect seems to be positive with up to a 2.6% increase in share of unemployment due to the programme. This is consistent with literature which has shown increased unemployment for women in case of child benefit programmes. The number of resignations from unemployment status is consistent with the decrease of overall registrations and is equal to 9.53 per month per county on average for 1 year estimations.

Two additional effects were tested. Firstly, an anticipation effect was tested for a February

2016 threshold when the programme was approved by the parliament. The coefficients are slightly larger for the overall number of registrations for all three estimation windows, up to -146.19 which translates to roughly 0.14% of the population. In the scale of one year this is over 1.5%. The effects found for the rural population were larger but for women the effect was smaller. Anticipation effects are therefore possible and a likely cause of the differences in estimations. The second effect tested was for the effect of child birth in response to the programme and here the significant findings were significantly smaller coefficients as well as a change in the coefficient for women, which now showed a negative effect (smaller share of women in unemployment).

Whereas the findings of this paper can be interpreted to an extent, due to the lack of data the coefficients are likely biased. Because not all unemployed had access to the 500+ programme the use of fuzzy RD would be advised in order to obtain unbiased estimates. Unfortunately, to my knowledge there is no data available for the number of benefit claimants over time, which would be extremely valuable to this research. An extension of this paper would be to use fuzzy RD as well as look at the expansion of the programme in July 2019, which saw the income requirement scrapped for 1 child families. It is likely that more research will be published on the programme in the coming months and years, not only in terms of the labour market effects but a more comprehensive overview of the consequences.

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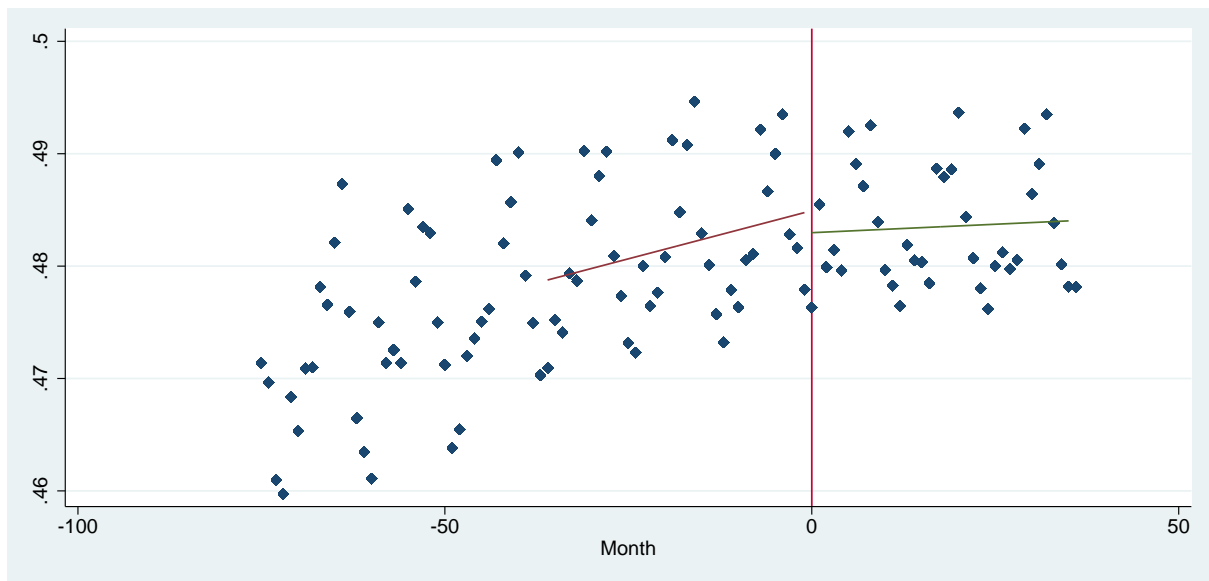
8 Appendix

Figure 6: Proportion of rural population in unemployment. Trend lines are estimated over 3 year windows before and after the threshold.
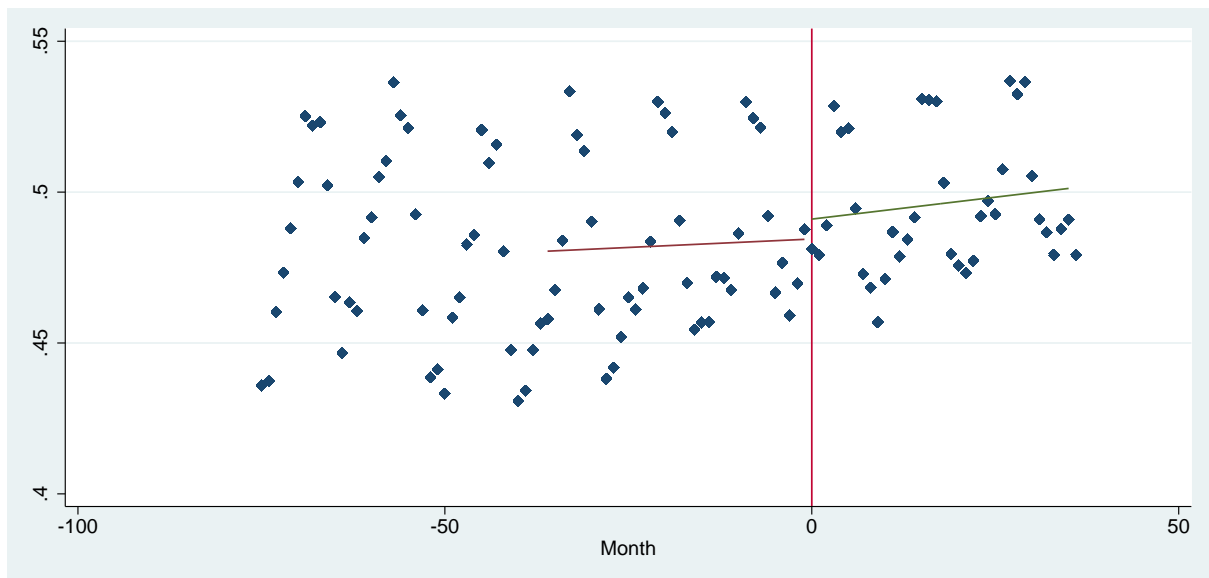

Figure 7: Proportion of women in unemployment. Trend lines are estimated over 3 year windows before and after the threshold.
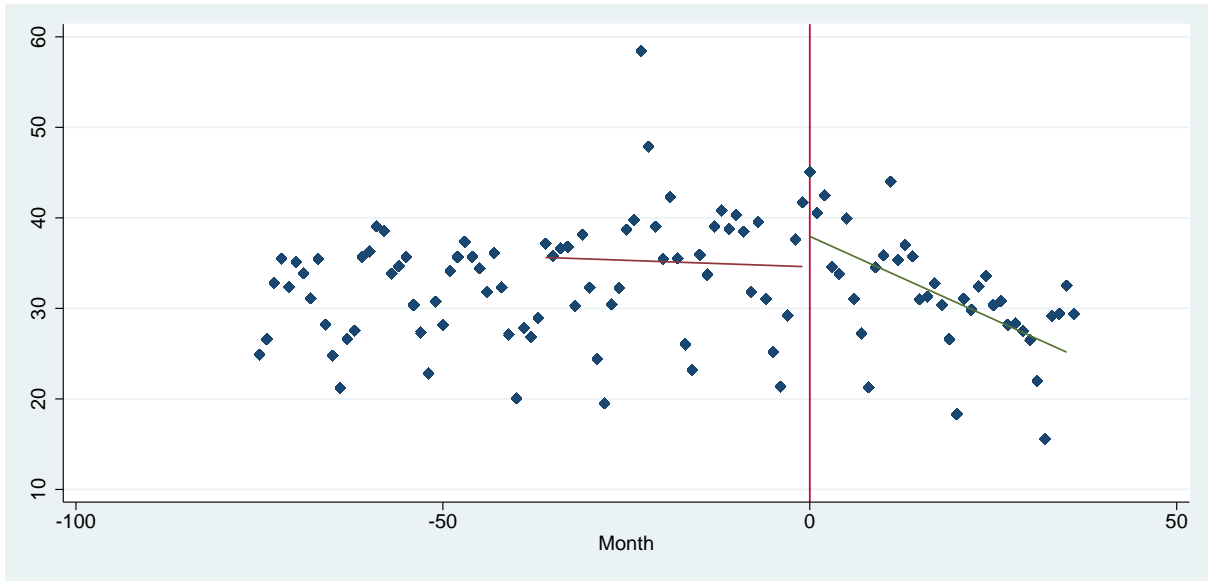
Figure 8: Number of resignations from unemployment status. Trend lines are estimated over 3 year windows before and after the threshold.

Figure 9: Page 2 of the form used to report data about the number of unemployed as well as their various characteristics from each individual county's unemployment office. Full form and/or English translation can be provided on request.

Dział 1. STRUKTURA I BILANS BEZROBOTNYCH

1.1. Struktura bezrobotnych

Wyszczególnienie			Bezrobotni zarejestrowani		Bezrobotni, którzy podjęli pracę		Bezrobotni zarejestrowani			
							ogółem		w tym z prawem do zasiłku	
			w miesiącu sprawozdawczym				w końcu mies. sprawozdawczego			
			razem	kobiety	razem	kobiety	razem	kobiety	razem	kobiety
0			1	2	3	4	5	6	7	8
Ogółem (w. 02+04)		01								
z tego osoby	poprzednio pracujące	02								
	w tym zwolnione z przyczyn dotyczących zakładu pracy	03								
	dotychczas niepracujące	04								
Wybrane kategorie bezrobotnych (z ogółem)										
Zamieszkali na wsi		05								
w tym posiadający gospodarstwo rolne		06								
Osoby w okresie do 12 miesięcy od dnia ukończenia nauki		07								
Cudzoziemcy		08								
Bez kwalifikacji zawodowych		09								
Bez doświadczenia zawodowego		10								
Kobiety, które nie podjęły zatrudnienia po urodzeniu dziecka		11	X		X		X		X	
Osoby będące w szczególnej sytuacji na rynku pracy		12								
z wiersza 12	do 30 roku życia	13								
	w tym do 25 roku życia	14								
	długotrwale bezrobotne	15								
	powyżej 50 roku życia	16								
	korzystające ze świadczeń z pomocy społecznej	17								
	posiadające co najmniej jedno dziecko do 6 roku życia	18								
	posiadające co najmniej jedno dziecko niepełnosprawne do 18 roku życia	19								
	niepełnosprawni	20								