# Children of the Decree: How the Romanian Abortion Ban Affected Labor Market Success and Health

By

Gergely B. Dóczy

Submitted to

Central Europen University

Department of Economics

In partial fulfillment of the requirements for the degree of Master of Arts in Economics

Supervisor: Professor John S. Earle

Budapest, Hungary

2010

## Abstract

The aim of this study is to examine the Romanian abortion ban's effect on labor market and health outcomes of children born after the policy change. In 1966 Romania's dictator, Nicolae Ceaușescu, issued a decree that forbade abortions. This resulted in an enormous rise in the birth rate, since in the previous years abortion had been the primary method of birth control. The results of the analysis show that women born after the ban have slightly lower wages than those born before, whereas, if there is an effect for men, then those born after the policy change earn a little more than those born before. Moreover, the Children of the Decree, as adults, have a higher chance of being unemployed or out of the labor force than children born prior to the policy change. They also smoke more and have a higher likelihood of being physically or mentally handicapped. A surprising and inexplicable result is that there are significantly fewer people suffering from chronic diseases among those born after the ban. Additionally, I provide evidence that the crowding in schools resulted in a higher unemployment of men.

## Acknowledgements

I am grateful for the most useful advices of my supervisor, Professor John S. Earle, for the invaluable help of Professor Álmos M. Telegdy, and for Professor Gábor Kézdi starting me on this track.

# Table of Contents

## List of Figures



## List of Tables

## Chapter 1: Introduction

Abortion has been around at least since the Antiquity. The Greeks often performed abortions to prevent their population from growing over a certain limit. In the Middle Ages the Great Witch-Hunt was initiated by the Catholic Church to limit birth control and abortion by eliminating its practitioners, the midwives. The purpose was to raise the number of births in order to repopulate Europe after the Great Plague (Heinsohn and Steiger 1999). In the modern ages most countries banned abortions, and they only started lifting the restrictions in the 20th century. However, this trend is fragile: there were some examples when the ban was reintroduced, and some countries still limit abortions up to this day[1].

There are several studies analyzing the consequences of abortion policies. Some of these examine the effect of the change in abortion legislation in the United States during the beginning of the 1970's. They find that lifting the restriction on abortion had a beneficial effect for those born afterwards. A study by Gruber, Levine and Staiger (1999) showed that the "marginal child" (the child that was not born because of legalized abortion) would have been 40-60 percent more likely to live in a single parent household, more likely to live in poverty, to receive welfare, or to die as an infant. Another study by Donohue, Grogger and Levitt (2009) found evidence that women born after the abortion ban was lifted were less likely to have teenage pregnancies. Charles and Stephens (2006) showed that those born after the legalization of abortion used fewer controlled substances. Levitt and Donohue (2001) found that the large and sudden drop in the crime rate at the beginning of the 1990's was partially caused by the legalization of abortions roughly eighteen years earlier.

Another example of an abortion policy change is the example of Romania. After World War II abortions were legal and provided free of charge by the state health care

[1] For example Nigeria

system, making Romania one of the most liberal countries in terms of abortion policy in the world. In 1966 Romania's dictator, Nicolae Ceaușescu almost completely prohibited abortions[2], resulting in an enormous rise in the number of births (the total fertility rate increased from 1.9 to 3.7 children per woman from one year to another). This policy was only abolished after the fall of the communist regime in 1989.

A study by Pop-Eleches (2006) found that Romanian children born after abortion became illegal had better educational and labor market outcomes. This strange result can be explained by the composition of women who used abortion as the main contraceptive method before the ban was introduced. In 1965 four out of five pregnancies were terminated (Berelson 1979), and most of these abortions were performed on urban and educated women. After the ban the "unwanted" children were born into these urban and educated households, which explains the odd increase in the level of education and labor market success. After controlling for this type of composition Pop-Eleches (2006) found that the "unwanted" children actually had inferior outcomes as adults.

This study presents additional evidence of the negative effects of the Romanian abortion ban. I build on the findings of Pop-Eleches (2006), and supplement it with other, new results. I assess whether the policy change had an effect on children's subsequent wages and labor market status. I also check whether the ban affected their probability of smoking, their likelihood of being physically or mentally handicapped, and of suffering from some chronic disease.

The basic methodology of this paper is similar to that of Pop-Eleches (2006), it is a comparison of the labor market and health outcomes of children born right before and right after the abortion policy change, while controlling for observable background characteristics.

[2] There were only a few exceptions, detailed in section 2.1.

I find that on average, women born after the ban earn less than those born before the policy change, while men earn slightly more or just as much as those born before. Also, the Children of the Decree[3] of both sexes had a higher chance of being unemployed or out of the labor force than children born before them. They also smoke more and have a higher likelihood of being physically or mentally handicapped. Additionally, I provide evidence that the crowding in schools resulted in a higher unemployment of men.

While these results are based on the experience of only one country, broader conclusions can still be drawn. This paper is an addition to the long row of studies proving the negative effect of abortion restrictions. It strengthens the already prevalent recommendation of researchers that any country considering abortion bans should bear in mind that it not only causes a lot of pain to the population, it also has a very negative effect on the children born in such restrictive regimes.

The paper is structured as follows. Chapter 2 provides an overview of the history of abortion in Romania and the methods and results of Pop-Eleches (2006). Chapter 3 describes the data and empirical strategy. Chapter 4 presents the results of the analysis. Chapter 5 includes the crowding effect extension and Chapter 6 presents the conclusions.



[3] Translation from the Romanian "Decreţeii", meaning children born after the abortion ban.

# Chapter 2: Abortion in Romania

## 2.1 A short history of abortion legislation in Romania

Between the end of World War II and 1957 abortions were restricted in Romania. The only exceptions were cases when the pregnancy threatened the mother's life, or when there was a high chance that the child would be born handicapped. Although prohibited by law, abortion was only penalized as a misdemeanor, and its practice was usually left to the discretion of doctors (Kligman 1998).

The interest in controlling reproduction changed in 1957, when abortion was fully legalized, making Romania one of the most liberal countries in terms of abortion policy in the world. Abortions were allowed in the first trimester and its cost was fully covered by the state health care system. During this time abortion was the most commonly used form of birth control (World Bank 1992). In 1965 four out of five pregnancies were aborted (Berelson 1979). This resulted in the total fertility rate dropping lower than 2 by 1966 (see figure 1). At this time Romania, just like its neighbor, Hungary, had the lowest fertility rate in the world (Kligman 1998), an average of 1.9 children per women.

According to Kligman (1998) the purpose of allowing abortions was to disrupt the familial social order and thus create a mobile workforce consisting of individuals unconstrained by family ties or traditions. The aim was to form the labor force necessary to carry out large industrialization plans and the forced collectivization of the countryside. Geographic mobility was controlled, and in a matter of years the demography of Romania changed. The working class grew in number and size. By 1966 the urban population grew to 38.2% from 23.4% in 1948 (Kligman 1998). This was a very short sighted policy, but it achieved its goals. In a matter of years the industrial workforce increased dramatically, but at the cost of a decreasing labor force in the future as a result of the low birth rate.

On October 1, 1966, just about one year after becoming the leader of the Romanian Communist Party, Nicolae Ceaușescu issued the unexpected Decree 770 that forbade the interruption of the course of a pregnancy (Kligman 1998). "The fetus is the property of the entire society," he proclaimed. "Anyone who avoids having children is a deserter who abandons the laws of national continuity." (Nicolae Ceaușescu quoted in Levitt and Dubner 2009). The abortion ban was designed to achieve one of Ceaușescu's major aims: to strengthen Romania by increasing its population[4]. According to Kligman (1998) "all the state did was expropriate the right to determine family size in order to meet its labor needs".

Abortions could only be performed legally on women above the age of 45, women who already had at least four children, and for pregnancies resulting from rape or incest. The interruption of pregnancy was also allowed when the mother's life was in danger, or if one of the parents suffered from a serious hereditary illness (Kligman 1998). Also, abortion was made available to women with a significant position in the communist party (Levitt and Dubner 2009). The use of contraceptives was not forbidden by law; it had simply become impossible to obtain them.

Government agents, known as the Menstrual Police[5], regularly administered pregnancy tests to women at their workplaces, and fined a steep "celibacy tax" on women who regularly failed to conceive (Levitt and Dubner 2009). The purpose of these screenings was to discover early pregnancies and then monitor the women until birth.

Decree 770 did not eradicate abortions; it just made them much more costly. A whole new underground abortion industry surfaced in a very short time. Illegal pregnancy

[4] According to the documentary entitled Children of the Decree (2005), directed by Florin Iepan, Ceaușescu in private was a good father, who loved his children very much. But his ideas about what a family meant were rooted in his background. He came from a peasant's family with ten children. That's why it was hard for him to understand the refusal of Romanian women to have four or five children, as he'd decided. Kligman (1998) formulates this as "Ceaușescu transposed peasant family organization to the level of state socio-demographic plans".

[5] Named like this because of their habit of asking the date of the last period of women

interruptions were often performed by people without any medical training (Kligman 1998). An estimated 50% of illegal abortions left the mother unharmed; in other cases women required emergency hospital treatment for complications, or died (Kligman 1998). Women themselves tried to miscarry by trying methods that had absolutely no connection with medical practice.[6]

As a result of the policy change the total fertility rate increased from 1.9 in 1966 to 3.66 in 1967. As it can be seen from figure 1, the large number of births continued for about three or four years. After 1971 it stabilized, but at a higher level than before 1966, and higher than the average level of neighboring Bulgaria, Hungary and Russia. Abortions were only legalized after the fall of the communist regime in December 1989.

As Pop-Eleches (2006) had access to census data, he could determine the month when the pronatalist policy took effect. He found that the huge increase in the monthly birth rate has happened in June 1967[7]. Since unfortunately I have no data to verify it, I will just accept it and treat June 1967 as month 0 in my analysis. According to Pop-Eleches (2006), the average monthly birth rate between July and October 1967 was about three times higher than in the first half of the year. This can also be seen in the IHS sample (the one I use in my analysis), on figure 2. The largest number of people in this sample was born in July and August 1967, which is consistent with the 1992 census data used by Pop-Eleches (2006).



[6] These methods are further discussed in section 4.3.

[7] Pop-Eleches (2006) notes that the six months difference between the announcement of the abortion ban and the rise in the birth rate results from the fact that a pregnancy lasts nine months and abortion under the previous regulation was permitted in the first three months of pregnancy.

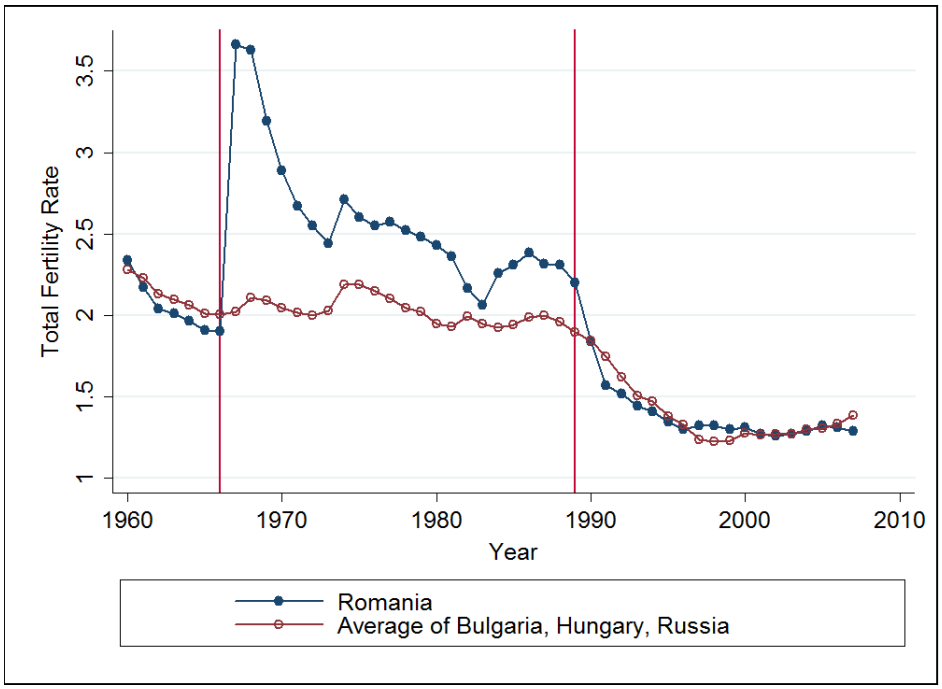



**Figure 1: Total fertility rates. The total fertility rate is "the average number of children that would be born per woman if all women lived to the end of their childbearing years and bore children according to a given fertility rate at each age." (CIA World Factbook definition) Source of fertility rate data: UNdata http://data.un.org/Data.aspx?q=romania+fertility+rate&d=WDI&f=Indicator_Code:SP.DYN.TFRT.IN;Country_Code:ROM#WDI**

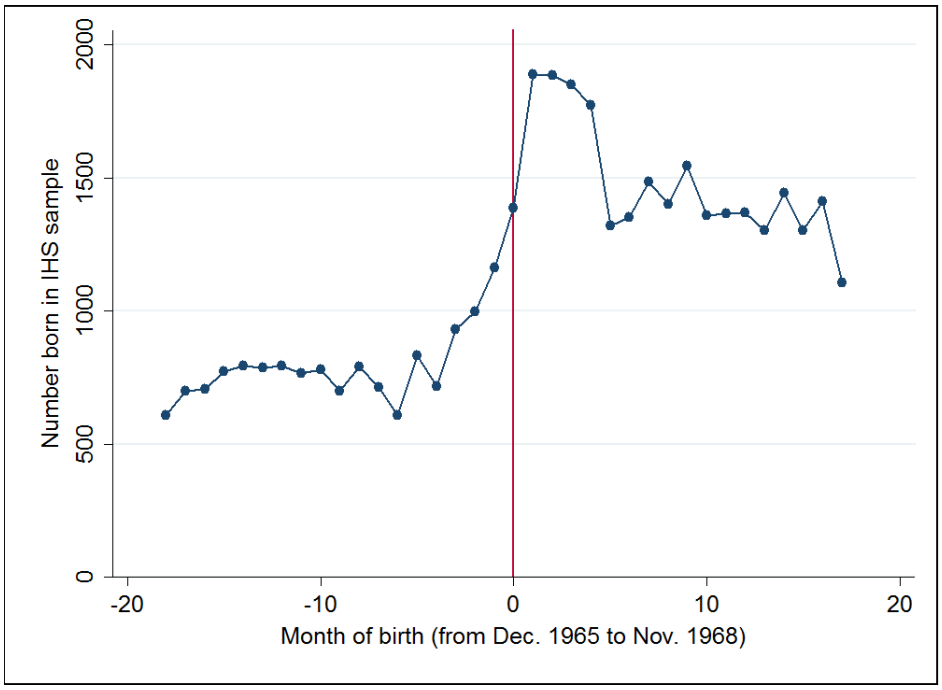



**Figure 2: IHS sample size by month of birth, for persons born between December 1965 and November 1968. Month 0 refers to June 1967.**

## 2.2 Methods and results of Pop-Eleches (2006)

### 2.2.1. The effects of abortion legislation

Pop-Eleches (2006) identifies a number of mechanisms through which abortion policy can influence a child's socioeconomic outcomes. The first one is the child quality/quantity tradeoff model (Pop-Eleches referring to Becker and Lewis 1973 and Becker 1981). This theory states that since parents want all their children to be of the same quality, when the number of children in the household increases the child quality decreases. The second mechanism is that the optimal timing of birth can have a large effect on the child's future development. If women cannot choose the best time to give birth, the child might be born into conditions which could be seen as less than perfect. The mother might be unmarried, or one who is still studying or willing to concentrate on her career (Pop-Eleches referring to Angrist and Evans 1999). Or the parents might not be physically or mentally ready to raise a child. This can have a long lasting effect on a child's wellbeing. The third effect, shown by Grossman and Jacobowitz (1981), Joyce (1987), and Grossman and Joyce (1990), is that better access to abortion increased children's weight at birth and decreased neonatal mortality. All these theoretical mechanisms imply a negative effect of abortion restrictions on children's development. Pop-Eleches (2006) calls the combined effect of the three mechanisms just reviewed the *"unwantedness effect"*, and this is how I will also refer to it in this paper.

In addition to the *unwantedness effect*, Pop-Eleches (2006) identifies two other ways through which abortion restrictions can affect the future outcomes of children. It is very important to check what kind of women use abortion most often. For example, in the United States evidence shows that disadvantaged women are more likely to have abortions, thus there is a higher chance that unwanted children are born to less than optimal

circumstances (Pop-Eleches referring to Gruber et al. 1999). Pop-Eleches (2006) calls this the "*composition effect"*, because it is the effect of the change in abortion rules on the composition of women who carry pregnancies to term.

The last consequence of abortion bans that Pop-Eleches (2006) identifies is the "*crowding effect"* that appears when the fertility impact of the ban is large. This sudden and large increase in the fertility rate results in "a larger cohort competing for scarce resources", as Pop-Eleches (2006) notes.

In this paper, similarly to Pop-Eleches (2006), I try to separate these three effects from each other. Unfortunately family background variables are not available in the dataset I use, but an individual's education might be a good proxy for parent's education, and type of locality where person lives might have a high correlation with the type of locality where the person was born. Furthermore, one's ethnicity most of the time is the same as his/her parent's ethnicity. So including these variables in the model will remove most of the variation caused by family background, thus removing a large part of the *composition effect*.

In chapter 5, following the extended framework of Pop-Eleches (2006), I estimate the effect of crowding in schools on children's outcomes. This crowding can very much affect educational outcomes, since in the short-run the capacity of the educational system is limited. Those that were part of the very large cohort born just after the abortion ban came into effect had a lower chance of being admitted to higher educational institutions, since class sizes and numbers were limited. This is what Pop-Eleches (2006) confirms, finding a large negative *crowding effect* on educational outcomes of children who started school in September 1967. But when estimating the abortion ban's effect on labor market or health outcomes, as it is done in this paper, the *crowding effect* might be less important. The Children of the Decree most probably had lower chances of finding jobs right after entering

the labor market, but with time this effect might have diminished, since they weren't just competing with those born right before them, they were competing with the whole Romanian labor force. Pop-Eleches (2006) finds a small and insignificant *crowding effect* in labor market outcomes. Also, the *crowding effect* most probably does not influence health outcomes since school enrollment dates surely do not influence one's health.

### 2.2.2. Data and models of Pop-Eleches (2006)

Pop-Eleches (2006) uses data from the 1992 Romanian census. He mainly relies on the sample consisting of those born between January and October 1967, about 55,000 observations. He states that this way it is possible to separate the *crowding effect* from the *unwantedness effect* and the *composition effect*. He writes that "Although the spike in births (…) occurred from July to October 1967, all children born from January to May, by law, had to enroll in school in the same year with the much larger group born in the later months." This is not true, since (as Pop-Eleches also notes) the government cutoff date for school enrollment was September 15. His sample also includes those who were born in the second part of September and in October 1967. These children were enrolled in the much larger following school grade that only consisted of children born after the abortion policy came into effect. These children most probably have experienced a much stronger crowding effect than those born before September 15 1967, so including them in the sample can add some *crowding effect* to the estimates.

Pop-Eleches (2006) specifies a separate sample for estimating the effects of crowding on child outcomes, to which he also adds those born in 1965 and 1966. In addition to the full sample, Pop-Eleches (2006) also reports the results for a restricted sample. This consists of those individuals who at the time of the census still lived with both of their

parents. For them it was possible to control for family background, thus removing the *composition effect*.

Pop-Eleches (2006) focuses on two socioeconomic outcomes of the Children of the Decree: educational achievement and labor market activity. Educational achievement is measured by education dummies (apprentice school, high school or more, and university or postgraduate). To measure labor market outcomes Pop-Eleches (2006) uses three skill specialization dummies: (1) elementary skill (individuals working in elementary occupations); (2) intermediate skill (clerks, service and sales workers, skilled agriculture workers, craft workers, and plant operators and assemblers); (3) high skill (technicians, associate professionals, and professionals). These categories are based on occupational codes from the International Standard Classification of Occupations (ISCO). Those individuals who were still enrolled in a university, with a university degree or with postgraduate degree were excluded from the labor market regressions because a large proportion of people still in school in the sample were enrolled in universities at the time of the census. It is a major limitation of the Pop-Eleches (2006) labor market outcome estimation that the Children of the Decree were still in school or only at the beginning of their career at the time of the 1992 census. This is one of the things I believe I can improve by using the IHS sample.

Pop-Eleches (2006) estimates three kinds of models. The first one is a simple difference equation to calculate the overall effect of the change in abortion laws. The second model also adds observable characteristics, such as family background variables (mother's and father's education, urban dummy for place of birth of the child, dummy for sex of the child and region of birth dummies) and household-specific variables (homeownership, rooms per occupant, square feet per occupant, availability of water, gas, sewerage, toilet, bath, heating and water).

The third model estimates the *crowding effect* on children's socioeconomic outcomes. In this model those born in 1965 and 1966 are also included. Children born after September 15 are dropped because this is the cutoff date for school enrollment, ensuring that those born in a given year are all enrolled in the same grade. Since those born in May 1967 might already contain some children born as a result of the abortion ban, Pop-Eleches (2006) drops those born in May from this specification in order to separate the *crowding effect* from the *unwantedness effect* The right-hand-side variables in this model include a dummy taking value one if the individual was born between June and September 1967; a dummy that takes value one if person was born between June and September 15; a dummy that takes value one if person was born in 1967; and the full set of controls present also in the previous equation. The coefficient on the *born in 1967* dummy measures possible crowding effects.

### 2.2.3. Results of Pop-Eleches (2006)

Pop-Eleches (2006) finds that the overall effect of the abortion ban on children's subsequent educational outcomes is large and positive. Children born after the Decree came into effect on average were more likely to finish high school or university than those born before. Only after adding background and household control variables does the coefficient on the after June 1967 dummy become large and negative. Pop-Eleches (2006) interprets this as a negative *unwantedness effect* after controlling for the *composition effect*. All these results are statistically significant and large.

When estimating the policy change's effect on children's labor market outcomes Pop-Eleches (2006) finds that just as in the case of educational outcomes, the overall effect of the policy change is positive and large. Children born after the ban were less likely to work

in low skilled occupations and more likely to work in jobs that require a higher level of skills. After including family background variables the effect again turns negative.

As for the *crowding effects*, Pop-Eleches (2006) finds that those children who started school with the cohort twice as large as the one in the previous year experienced lower educational achievements. He also found that the crowding effect in the labor market is small at best; the coefficients have the right sign but they are small and statistically insignificant. Pop-Eleches (2006) explains this by stating that while in the schooling system each age cohort has to be in a separate grade, in the labor market the *crowding effect* is spread over the entire Romanian labor market.

# Chapter 3: Data and empirical strategy

## 3.1 Data

The dataset I use is the Romanian Integrated Household Survey (IHS), gathered by the Romanian National Commission for Statistics (renamed National Institute of Statistics in 2001). It is an annual household survey that ran between 1994 and 2004. Between 1994 and 1996 the data gathering started in April and ended in March of next year. This means that, for example, the data referred to as 1994 was actually gathered between April 1994 and March 1995. In 1997 the IHS started in April and ended in November. Since 1998 the IHS started in January and ran until the end of the year. Although it was originally intended to be a panel dataset, different individuals were interrogated each year, so unfortunately following one person's evolution across time is not possible.

The sample size for each year of data gathering is between 80,000 and 97,000, except for 1997, when only around 62,000 individuals were questioned. Unfortunately there are relatively few observations of those born right before and right after June 1967. Pop-Eleches (2006) had data of 55,000 children born between January and October 1967 (5 months +/- June 1967). In the IHS, after pooling together all the data gathered between 1994 and 2004, there are only a little more than 14,000 observations for the same birth months. Since I use a regression discontinuity design, the closer my observations are to month zero, the more accurate the results are. Pop-Eleches (2006) notes that a short time interval "minimizes the effect of other unobserved time trends and preconception behavioral responses to the policy." But as I observe a narrower interval the chance of estimating statistically significant coefficients drops because of the smaller number of observations. This is the reason why I had to make a compromise between statistical significance and the accuracy of the estimation. So I defined three different sample

specifications. The smallest one is the most accurate, but there is a lower chance that the results will be significant. It consists of those born between December 1966 and November 1967 (6 months +/- June 1967). The middle sample size is defined as those born between June 1966 and May 1968 (12 months +/- June 1967). The largest sample consists of those born between December 1965 and November 1968 (18 months +/- June 1967).

Unfortunately none of the three sample sizes allows for completely separating the *crowding effect* from the other two effects (*unwantedness and composition effect*). Those born between December 1966 and September 15 1967 were, by law, obliged to enroll in school in the same grade, but those born between September 15 and the end of November had to enroll only one year later. So including them in the sample does not allow for estimating the pure *unwantedness effect*, unless the *crowding effect* is zero.

My small sample contains 15,354 observations, the middle sample 28,404, while the large sample 40,702. Out of these only 8,455 (small sample), 15,580 (middle sample), 22,177 (large sample) are employees (whose labor force status at the time of questioning was employee, had worked in the week before and had a gross wage different from 0). So in the model that explains the wage changes of employees only these observations are used. For the health outcome variables unfortunately I only have data gathered between 2001 and 2004. This is why in these models my small sample consists of only 5,466 individuals, the middle one of 10,113, and the large one of 14,570. In every sample specification the number of treatments is about twice the number of controls (see table 1).

**Table 1: Summary statistics**

| SAMPLE | | SMALL SAMPLE | | | MIDDLE SAMPLE | | | LARGE SAMPLE | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Variable | Controls | Treatments | Difference | Controls | Treatments | Difference | Controls | Treatments | Difference |
| FULL SAMPLE | | | | | | | | | | |
| | Unemployed | .100 | .108 | .008 | .096 | .105 | .009** | .094 | .105 | .011*** |
| | Out of labor force | .139 | .141 | .002 | .137 | .145 | .008* | .139 | .147 | .008** |
| | Female | .518 | .519 | .001 | .514 | .517 | .003 | .511 | .513 | .002 |
| | City | .548 | .576 | .027*** | .536 | .572 | .036*** | .530 | .564 | .034*** |
| | Professional training | .376 | .358 | -.018** | .368 | .362 | -.006 | .369 | .366 | -.003 |
| | High school | .374 | .407 | .033*** | .380 | .395 | .015** | .380 | .396 | .016*** |
| | Post high school education | .107 | .112 | .005 | .108 | .114 | .006* | .107 | .111 | .004 |
| Observations | | 5,244 | 10,110 | | 9,788 | 18,616 | | 14,151 | 26,551 | |
| ONLY EMPLOYEES | | | | | | | | | | |
| | Female | .456 | .452 | -.004 | .455 | .452 | -.003 | .451 | .447 | .004 |
| | City | .678 | .696 | .018* | .671 | .697 | .026*** | .664 | .691 | .027*** |
| | Professional training | .344 | .322 | -.022** | .336 | .326 | -.010 | .334 | .330 | -.004 |
| | High school | .445 | .468 | .023** | .447 | .455 | .008 | .450 | .456 | .006 |
| | Post high school education | .165 | .165 | .000 | .166 | .172 | .006 | .164 | .168 | .004 |
| Observations | | 2,882 | 5,573 | | 5,393 | 10,187 | | 7,736 | 14,441 | |
| HEALTH | | | | | | | | | | |
| | Smoke | .337 | .360 | .023* | .321 | .360 | .039*** | .332 | .354 | .022*** |
| | Handicapped | .0103 | .0179 | .0076** | .0130 | .0159 | .0029 | .0141 | .0156 | .0015 |
| | Chronic disease | .0337 | .0328 | -.0009 | .0384 | .0329 | -.0055 | .0437 | .0344 | -.0093*** |
| | Female | .516 | .517 | .001 | .528 | .518 | .010 | .514 | .516 | .002 |
| | City | .538 | .577 | .039*** | .534 | .572 | .038*** | .536 | .568 | .032*** |
| | Professional training | .387 | .378 | -.009 | .377 | .387 | .010 | .377 | .391 | .014* |
| | High school | .349 | .370 | .021 | .355 | .357 | .002 | .356 | .355 | -.001 |
| | Post high school education | .121 | .137 | .016 | .122 | .135 | .013* | .123 | .133 | .010 |
| Observations | | 1,839 | 3,627 | | 3,459 | 6,654 | | 5,036 | 9,534 | |

Note: The small sample contains those born between December 1966 and November 1967 (6 months +/- June 1967). The middle sample contains those born between June 1966 and May 1968 (12 months +/- June 1967). The large sample contains those born between December 1965 and November 1968 (18 months +/- June 1967).
The full sample contains every individual in the IHS survey born within the given timeframe. The only employees sample includes only those whose labor force status was employee at the time of questioning, worked in the week before that and had a gross wage different from 0. The health sample contains every individual in the IHS survey born within the given timeframe, whose data was collected between 2001 and 2004.
Those born before June 1967 are considered controls, and those born in or after June 1967 are considered treatments. Variables are defined in detail in Appendix table 9.
* Significant at the 10 percent level for the difference in means. ** Significant at the 5 percent level for the difference in means. *** Significant at the 1 percent level for the difference in means.

I focus on two sets of outcome variables: labor market and health measures. I estimate the effect of the abortion ban on wages and the probabilities of being unemployed or being out of the labor force. As of health measures, I try to find the effect of the ban on the probability that the person is smoking, has some kind of handicap, and whether suffers from some chronic disease.

Table 1 shows the summary statistics of all the sample specifications. It can be seen that a higher proportion of the treatments live in cities, graduate from high school, are unemployed or out of the labor force than of the controls. It can also be deducted that more of the Children of the Decree smoke, have some kind of handicap, and fewer of them suffer from chronic diseases than those born before them[8].

### 3.2 Empirical strategy

I estimate two kinds of equations to capture the effect of the abortion ban. The first one is a simple difference equation that captures the overall impact of the abortion policy change:

$$OUTCOME_i = \alpha_0 + \alpha_1 \cdot after_i + \alpha_2 \cdot Y_i + \epsilon_i \quad (1)$$

where $OUTCOME_i$ is one of the labor market or health outcome variables, and $after_i$ is a dummy equal to one if the person was born after June 1967. $Y_i$ represents ten year dummies, one for each year from 1995 to 2004. These are equal to one if data about the individual was gathered in that particular year, zero otherwise. Within this framework the coefficient $\alpha_1$ captures the overall impact of the abortion ban on the labor market or health

[8] Table 1 also confirms the finding of Pop-Eleches (2006) that children born after the abortion ban came into effect are on average more educated. In each sample there is a lower proportion of those who have only professional training (which is considered inferior to graduating from high school or university), and a higher proportion of individuals who have high school or university as their highest level of education.

outcomes. This equation is the same as equation (1) in Pop-Eleches (2006), except for the added year dummies.

The next equation incorporates several control variables for observable individual characteristics:

$$OUTCOME_i = \beta_0 + \beta_1 \cdot after_i + \beta_2 \cdot Y_i + \beta_3 \cdot X_i + \epsilon_i \quad (2)$$

where $OUTCOME_i$, $after_i$ and $Y_i$ are the same as in the previous framework, and $X_i$ represents the following control variables: three education dummies, female dummy for gender, city dummy for place of residence and four ethnicity dummies[9]. These control variables are potentially endogenous to the policy change. By including these I can partially control for the individual's family background[10]. Since a person's education might have a large correlation with his/her parent's education, including it in the model removes most of the variation caused by parent's education. Similarly, including the type of locality where the person lives might be a good proxy for place of birth. Also, a person's ethnicity is most of the times the same as his/her parent's ethnicity. I include ethnicity because different ethnic groups might have been influenced by the abortion ban to a different degree. The Roma were less severely influenced by the ban, because they were often not considered important building blocks of the society by the medical commissions and were often allowed abortions in hospitals despite the legal ban (Florin Iepan: *Children of the Decree*, 2005, documentary).

Assuming that these variables control for the *composition effect* and that any unobservable factors that influence labor market and health outcomes are constant across



[9] I did not include household specific variables (whether they had a bathroom, toilet, water, sewerage) because many times this information was missing and it would have cut my sample in half. I think these wouldn't have made much of a difference because the urban dummy account for most of this variation anyhow.

[10] This is important because the policy change had different effects on different groups, those that used abortion frequently before (urban and educated women) were hit the hardest. So by including these variables most of the *composition effect* can be controlled for.

individuals, I can interpret the coefficient $\beta_1$ as the *combined unwantedness* effect and *crowding effect*. Pop-Eleches (2006) interprets it as the sole *unwantedness effect*, but I argue that even in his sample of those born between January-October 1967 there is some *crowding effect*. I base this on the fact that the cutoff date of school enrollment is September 15, and he still includes those born in the second half of September and in October in his model. All my sample sizes contain more than just one school grade, so there is always some *crowding effect* present. What is important is that these estimates most probably remove the *composition effect* from the model. So I interpret the difference $\alpha_1 - \beta_1$ as the *composition effect*. If $\alpha_1 > \beta_1$ the *composition effect* is positive, which means that urban and educated people have a higher than mean average outcome. If it is the other way around, I interpret the *composition effect* to be negative, meaning that urban and educated people have a lower than the mean average outcome.

# Chapter 4: Results

## 4.1 The effects of the abortion ban on wages

Regression results of the gross wage outcome for equation (1) are in columns 1, 3 and 5 of table 2. These are the estimates for $\alpha_1$ for the three different sample sizes. I interpret these as the overall effect of the abortion ban on the gross wages of children born after the abortion ban. In columns 2, 4 and 6 are the estimates of the treatment coefficient in equation (2). I interpret these as the overall effect of the abortion ban without the *composition effect*, given that the used control variables are good proxies for family background.

First I examine the effect of the abortion policy change on labor market outcomes for both sexes together, and then separately for women and men. The reason for doing this is that women are more likely to be out of the labor force than men for several potential reasons. Especially in Romania, but in many other countries too, they go on maternity leave more often than men go on paternity leave, and they are more likely to take care of the children after the leave is over than men. This is why I think it makes sense to check if the abortion ban had a different effect on the two genders, and as my results prove, it did.

The effect of the abortion ban on wages for both genders jointly is small. Its sign is inconclusive and the coefficients are statistically insignificant. But once we take a look at the effects for separate sexes the results are much clearer. For women the coefficients on the treatment dummy are always negative, and statistically significant in case of the large sample. The coefficients are between -1.11 percent and -2.29 percent, which points to a large negative effect of the ban on women's wages. Based on this, I think it is reasonable to state that the abortion ban caused a significant decrease in the wage of women, somewhere between -1% and -2.5%. For men the coefficients are much smaller, positive and

**Table 2: Regression results for log gross wage outcome**

| | SMALL SAMPLE | | MIDDLE SAMPLE | | LARGE SAMPLE | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| BOTH GENDERS | | | | | | |
| Treatment dummy | .0008 | -.0054 | .0048 | -.0031 | -.0042 | -.0118* |
| | (.0109) | (.0098) | (.0080) | (.0073) | (.0067) | (.0061) |
| FEMALE | | | | | | |
| Treatment dummy | -.0119 | -.0169 | -.0111 | -.0173 | -.0228** | -.0294*** |
| | (.0156) | (.0144) | (.0115) | (.0106) | (.0097) | (.0089) |
| MALE | | | | | | |
| Treatment dummy | .0086 | .0021 | .0162 | .0073 | .0087 | .0012 |
| | (.0144) | (.0135) | (.0107) | (.0010) | (.0089) | (.0084) |
| Controls | No | Yes | No | Yes | No | Yes |

Note: The table presents the results of simple OLS regressions. The small sample contains those born between December 1966 and November 1967 (6 months +/- June 1967). The middle sample contains those born between June 1966 and May 1968 (12 months +/- June 1967). The large sample contains those born between December 1965 and November 1968 (18 months +/- June 1967). The dependent variable is the logarithm of gross wage. Those born before June 1967 are considered controls, and those born in or after June 1967 are considered treatments. The background controls included are three educational dummies, a female dummy for gender, a city dummy for place of residence, and four ethnicity dummies. Year of data gathering dummies always included. Robust standard errors are shown in parentheses. Variables are defined in detail in Appendix table 9.

* Significant at the 10 percent level

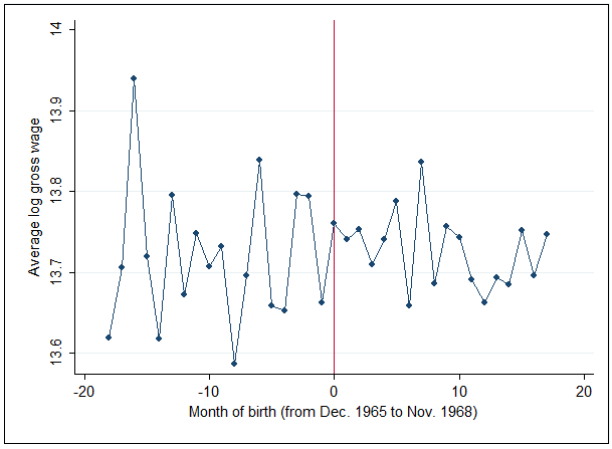
** Significant at the 5 percent level

*** Significant at the 1 percent level

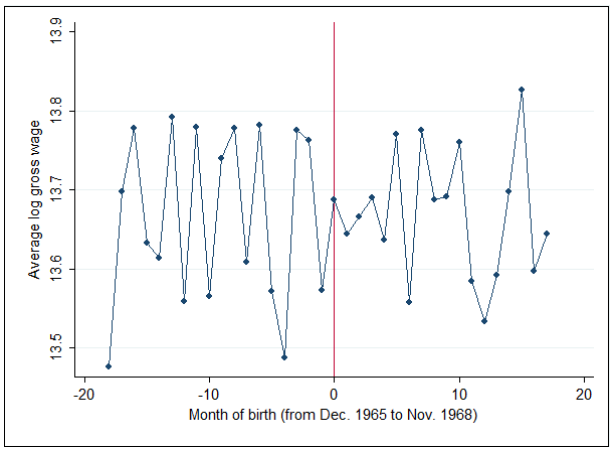
insignificant. So, if any, the abortion ban had a small positive change on men's gross wages. But none of the coefficients is statistically significant, so it would be a mistake to state that for men the abortion ban surely had any effect on wages.

The difference between the abortion ban's effect on the wages of the two sexes is very strange, and unfortunately I cannot explain it. But if the estimation method is correct and there are no problems with the data (and I think this is the case), then these results are correct. I decided to present them even though I cannot give an explanation, because I think that the fact that I cannot explain something does not mean it is wrong.

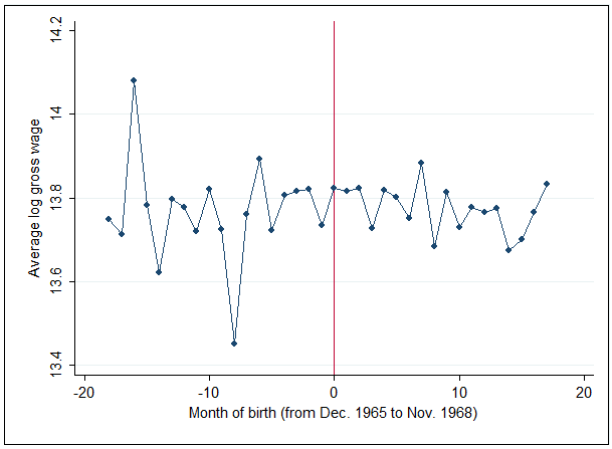
In the case of the log gross wage outcome, the results with control variables are always smaller than the overall effect, so the *composition effect* is positive. This means that urban and educated people on average have higher wages, which is a credible result.




**Panel A: Log wage by month of birth, both genders**




**Panel B: Log wage by month of birth, female**




**Panel C: Log wage by month of birth, male**

**Figure 3: Average logarithm gross wage by birth month, raw data, for persons born between December 1965 and November 1968. Month 0 refers to June 1967 (large sample). Variables are defined in detail in Appendix table 9. Source: IHS**

Figure 3 presents the average logarithm gross wage by birth month, the raw data, for persons born between December 1965 and November 1968. In panel A and C, for both genders and males, the graphs confirm that the abortion ban had no noticeable effect on wages. But for women, as it can be seen in panel B, there is a small negative effect. It is hard to notice, but after month 0 there are much fewer points close to the 13.8 value on the Y axis, and much more close to 13.7.

### 4.2 The effects of the abortion ban on labor market status

Table 3 presents the results for the first labor market status outcome variable, unemployment. As in table 2, the results of equation (1) are in columns 1, 3 and 5, while the results of equation (2) are in columns 2, 4 and 6. Just as in the case of the gross wage outcome, I do the exercise first for both sexes together, and then repeat it separately for women and men.

For both genders jointly the overall effect of the abortion ban on unemployment is large and significant. The Children of the Decree, as adults, were more likely to be unemployed than those born before them (by somewhere between 0.8 and 1 percent from a mean of 10 percent).

For the female sample, the effect of the unemployment is smaller than the average effect for both genders, and it is statistically insignificant. The coefficients are positive and fairly large (they lie between 0.4 and 1 percent from a mean of 9 percent), but the hypothesis that they are equal to zero cannot be rejected. Since, as it can be seen in chapter 5, the crowding effect on female unemployment is zero, the $\beta_1$ estimates represent the sole *unwantedness effect*.

**Table 3: Regression results for unemployment outcome**

| | SMALL SAMPLE | | MIDDLE SAMPLE | | LARGE SAMPLE | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| BOTH GENDERS | | | | | | |
| Treatment dummy | .0078 | .0086* | .0090** | .0091** | .0105*** | .0101*** |
| | (.0052) | (.0050) | (.0037) | (.0036) | (.0030) | (.0030) |
| Observed probability | .1055 | .1055 | .1023 | .1023 | .1017 | .1017 |
| FEMALE | | | | | | |
| Treatment dummy | .0099 | .0083 | .0056 | .0045 | .0048 | .0039 |
| | (.0067) | (.0066) | (.0049) | (.0048) | (.0041) | (.0040) |
| Observed probability | .0951 | .0951 | .0906 | .0906 | .0897 | .0897 |
| MALE | | | | | | |
| Treatment dummy | .0054 | .0086 | .0125** | .0139** | .0166*** | .0171*** |
| | (.0078) | (.0076) | (.0056) | (.0055) | (.0046) | (.0045) |
| Observed probability | .1168 | .1168 | .1148 | .1148 | .1143 | .1143 |
| Controls | No | Yes | No | Yes | No | Yes |

Note: The table presents the results of probit regressions. The coefficients capture the effect of switching the value from zero to one (since only dummies are used as independent variables). The small sample contains those born between December 1966 and November 1967 (6 months +/- June 1967). The middle sample contains those born between June 1966 and May 1968 (12 months +/- June 1967). The large sample contains those born between December 1965 and November 1968 (18 months +/- June 1967). The dependent variable is the unemployed dummy. Those born before June 1967 are considered controls, and those born in or after June 1967 are considered treatments. The background controls included are three educational dummies, a female dummy for gender, a city dummy for place of residence, and four ethnicity dummies. Year of data gathering dummies always included. Robust standard errors are shown in parentheses. Variables are defined in detail in Appendix table 9.

* Significant at the 10 percent level

** Significant at the 5 percent level

*** Significant at the 1 percent level

For men the effect of the abortion ban on unemployment is large and statistically significant. The Children of the Decree, as adults, were more likely to be unemployed by somewhere between 0.5 and 1.7 percent from a mean of 11 percent. The effect is the most substantial and statistically significant in the large sample. This can be explained by the results in the crowding effects extension. As it is explained in more detail in chapter 5, the crowding in school grades had a large and significant effect on male unemployment. So the larger the crowding effect is, the larger male unemployment is. Out of the three sample sizes the small sample has the lowest crowding effect because the treatments in this sample were part of the smaller school grade that also included the lower number of children born before

the abortion ban took effect. A larger proportion of the treatments in the middle and large sample were part of the much larger school grades that were fully made of children born in the wave after June 1967. So the result that for those who were born later the ban had a larger effect on unemployment can be explained by the larger *crowding effect* they were exposed to in their school years.

For women, the *composition effect* is positive, while for men it is negative. This means that urban and more educated women have a higher than average unemployment rate, and urban and more educated men have a lower than the mean average unemployment.

Table 4 presents the results for the second labor market status outcome variable, out of labor force. As in the previous two tables, the results of equation (1) are in columns 1, 3 and 5, and the results of equation (2) are in columns 2, 4 and 6.

For both genders jointly the effect of the abortion ban on the proportion of people being out of the labor force is significant and large for the middle and the large sample, but small and insignificant for the small sample. Unfortunately I cannot explain why it took one year for the policy change to take effect on children's subsequent probability of being out of the labor force as adults. For this outcome variable, as it is presented in chapter 5, there is no *crowding effect* present.

For the middle and large samples the overall effect of the abortion ban on the out of labor force outcome is 0.8 percent from a mean of 14 percent and it is statistically significant. If I control for the *composition effect* the coefficients rise to 1.1 percent from the same mean of 14 percent. Since there is no *crowding effect*, this can be identified as the pure *unwantedness effect*. The composition effect is large and negative, around 0.3 percent.

**Table 4: Regression results for out of labor force outcome**

| | SMALL SAMPLE | | MIDDLE SAMPLE | | LARGE SAMPLE | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| BOTH GENDERS | | | | | | |
| Treatment dummy | .0013 | .0064 | .0081* | .0110*** | .0084** | .0113*** |
| | (.0059) | (.0050) | (.0043) | (.0037) | (.0036) | (.0031) |
| Observed probability | .1409 | .1409 | .1423 | .1423 | .1445 | .1445 |
| FEMALE | | | | | | |
| Treatment dummy | -.0031 | .0044 | .0103 | .0171** | .0088 | .0152** |
| | (.0098) | (.0098) | (.0073) | (.0072) | (.0062) | (.0061) |
| Observed probability | .2316 | .2316 | .2353 | .2353 | .2396 | .2396 |
| MALE | | | | | | |
| Treatment dummy | .0055 | .0069 | .0046 | .0055* | .0065** | .0071*** |
| | (.0048) | (.0042) | (.0035 | (.0032) | (.0029) | (.0026) |
| Observed probability | .0429 | .0429 | .0428 | .0428 | .0445 | .0445 |
| Controls | No | Yes | No | Yes | No | Yes |

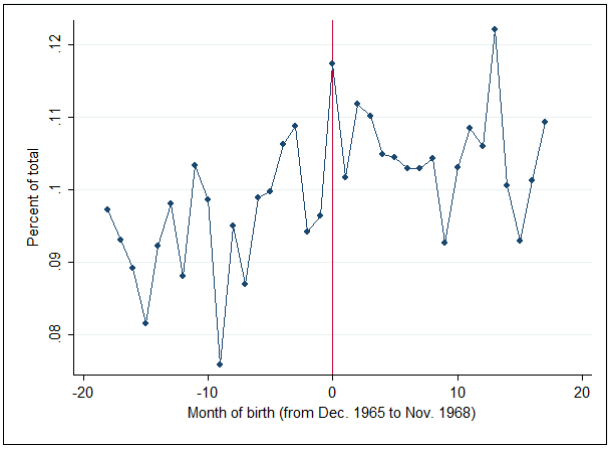
Note: See the note to table 3. The dependent variable is the out of labor force dummy.
* Significant at the 10 percent level
** Significant at the 5 percent level
*** Significant at the 1 percent level

This means that urban and educated people might be less likely to be out of the labor force than the average person.

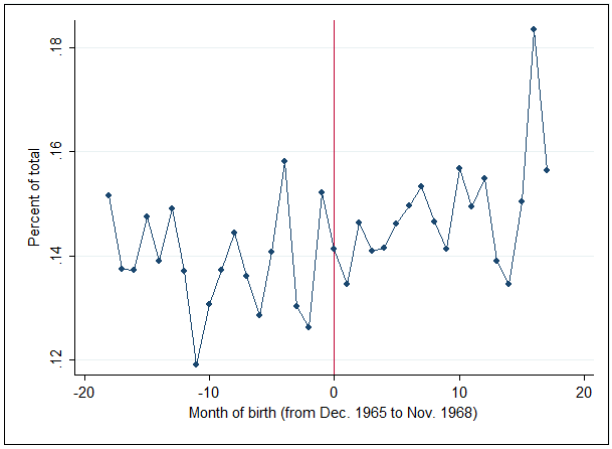
After breaking down the estimates to the separate sexes, it becomes clear that the effect of the abortion ban on being out of the labor force is much larger in absolute terms for women than it is for men. But once I take into account that women have a higher observed probability of being out of the labor force than men, the effect for men becomes much higher.

For women in the small sample the effect is strangely negative and insignificant. For men it is positive, but also insignificant. Once controls are added, for women the effect turns positive, but still small and insignificant.

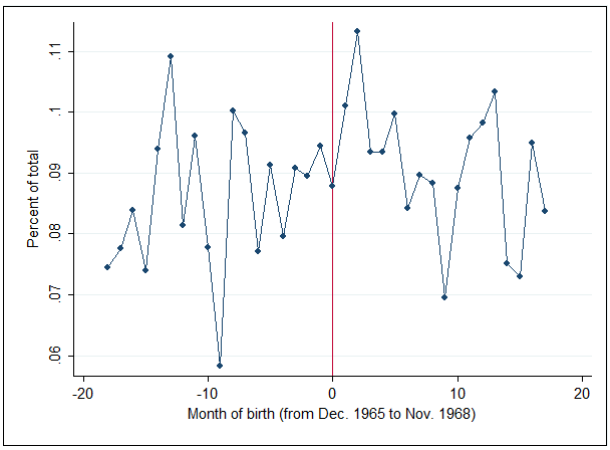
In the case of women, in the middle and large samples the effect of the ban on the probability of being out of the labor force is not too large and statistically insignificant



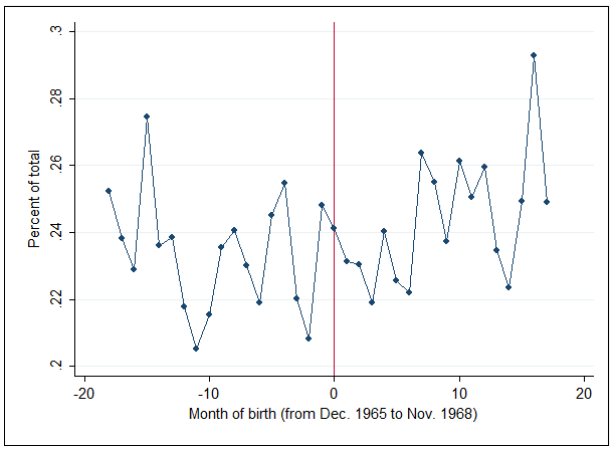

**Panel A: Unemployed by month of birth, both genders**



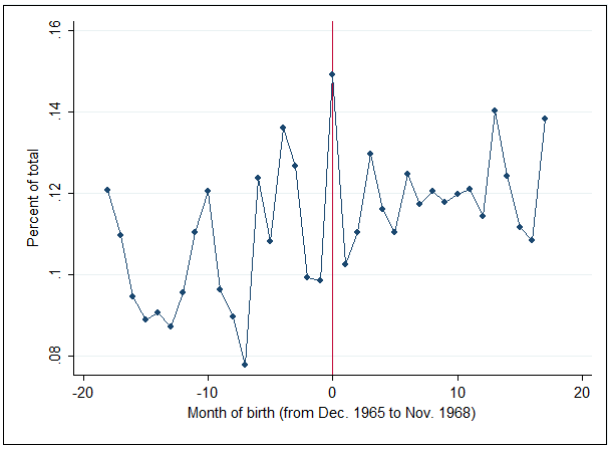

**Panel D: Out of labor force by month of birth, both genders**



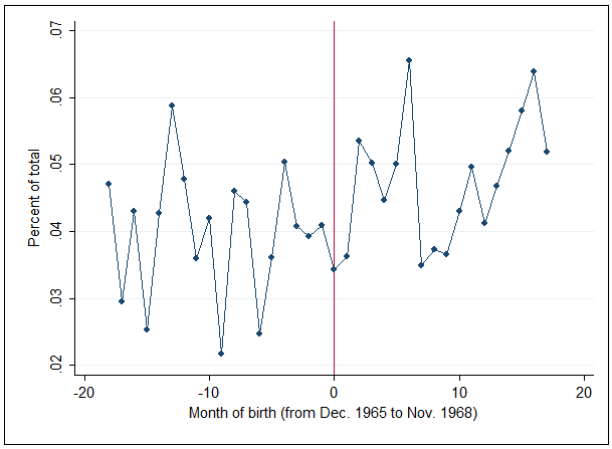

**Panel B: Unemployed by month of birth, female**




**Panel E: Out of labor force by month of birth, female**




**Panel C: Unemployed by month of birth, male**




**Panel F: Out of labor force by month of birth, male**

**Figure 4: Labor market status by birth month, raw data, for persons born between December 1965 and November 1968. Month 0 refers to June 1967 (large sample). Panels A, B and C present the proportion of the total who are unemployed and panels D, E and F present the proportion of those out of the labor force. Variables are defined in detail in Appendix table 9. Source: IHS**

(around 1 percent from a mean of 23 percent). It becomes bigger and significant (1.5 percent from a mean of 23 percent) only after controlling for background variables. Since, as chapter 5 proves, there is no crowding effect on the probability of being out of the labor force, this estimate is the pure *unwantedness effect*.

In the middle and large samples the *composition effect* is around -0.7 percent, meaning that urban and educated women have a lower than average proportion of individuals that are out of the labor force. I think it is credible that during the large industrialization period of the communist era urban and educated women were more likely to be employed than others.

For men the effect is large in both the medium and large samples. The overall effect is insignificant in the medium sample (0.4 percent from a mean of 4 percent), but highly significant in the large sample (0.6 percent from a mean of 4.5 percent). After adding the control variables the treatment coefficient becomes larger and statistically significant (0.5 and 0.7 percent from a mean of 4.5 percent). Again, this is the sole *unwantedness effect*, since the crowding effect is zero.

For men in the middle and large samples the composition effect is around -0.1 percent from a mean of 4 percent. The explanation is the same as for women, that urban and educated individuals had a lower chance of being out of the labor force.

The overall effect of the abortion ban on labor market status outcomes can be clearly seen on the graphs in figure 4. Panels A, B and C present the proportion of the total that were unemployed, and panels D, E and F present the proportion of those that were out of the labor force. In panel A after month 0 unemployment visibly rose. In panel B, for women, the effect is hard to see, but it seems like the average unemployment after month 0 is a little higher than before. In panel C, for men, it is again easy to spot the higher

unemployment after June 1967. The rise in the overall proportion of those that are out of the labor force can be seen in panel D and E. For men, in panel F, it is harder to see, but it seems like there is a minor rise.

### 4.3 The effects of the abortion ban on health

Table 5 presents the results for the health outcome variables. As in the previous tables, the results of equation (1) are in columns 1, 3 and 5, while the results of equation (2) are in columns 2, 4 and 6. Because I can think of no mechanism through which a large school grade can influence one's health, I take the *crowding effect* in case of health outcomes to be zero. So I interpret the results of equation (2), $\beta_1$, as the pure *unwantedness effect*.

The small sample results for the smoke outcome variable are large, but not statistically significant. The estimates from the middle and large sample are large and very significant. The overall effect of the abortion ban on smoking is between 2.2 and 3.9 percent from a mean of 35 percent. The *unwantedness effect* on smoking is somewhere between 2.2 and 3.4 percent from the same mean of 35 percent.

The *composition effect* is always positive, the *unwantedness effect* estimates are in all three sample sizes smaller than the overall effect. This means that urban and educated people were more likely to smoke than those living in villages or who had lower educational levels.

It is easy to imagine that a rough childhood increases the chances of smoking as an adult. One paper, by Nichols and Harlow (2003), finds that women who were abused as children have a higher probability of becoming smokers once grown up. Unwantedness could also have a similar effect, raising the likelihood of smoking. Children who were born into less than optimal conditions, or who grew up in institutions (as many unwanted Romanian children did), might be less resistant to bad influences and thus more prone to

**Table 5: Regression results for health outcomes**

| | SMALL SAMPLE | | MIDDLE SAMPLE | | LARGE SAMPLE | |
|---|---|---|---|---|---|---|
| Outcome variable | (1) | (2) | (3) | (4) | (5) | (6) |
| Smoke | .0237* | .0221 | .0388*** | .0344*** | .0226*** | .0219*** |
| | (.0136) | (.0139) | (.0098) | (.0101) | (.0082) | (.0084) |
| Observed probability | .3527 | .3527 | .3468 | .3468 | .3469 | .3469 |
| Handicap | .0076** | .0066*** | .0029 | .0031 | .0015 | .0018 |
| | (.0031) | (.0022) | (.0024) | (.0018) | (.0020) | (.0015) |
| Observed probability | .0153 | .0153 | .0149 | .0149 | .0151 | .0151 |
| Chronic disease | -.0006 | .0008 | -.0053 | -.0044 | -.0091*** | -.0085*** |
| | (.0050) | (.0047) | (.0038) | (.0037) | (.0034) | (.0032) |
| Observed probability | .0333 | .0333 | .0348 | .0348 | .0376 | .0376 |
| Controls | No | Yes | No | Yes | No | Yes |

Note: See the note to table 3. The dependent variables are three health outcome dummies: smoke, handicap and chronic disease.
* Significant at the 10 percent level
** Significant at the 5 percent level
*** Significant at the 1 percent level

take up smoking. Unfortunately this is just a hypothesis; it cannot be proven based on the available data.

The overall effect of the abortion ban on the proportion of handicapped people is enormous and very statistically significant in the small sample. As a result of the policy change the probability of being handicapped grew by 0.76 percentage points from a mean of 1.53 percent. The change is half of the observed probability.

The main cause for this can be that women, after abortions suddenly became legally unavailable, resorted to many "traditional" practices to induce miscarriage. Kligman (1998) notes a few of these: lifting heavy items (for example rearranging heavy furniture); jumping from heights; or repeatedly performing both until exhaustion[11]; preparing and administering different concoctions; introducing all kinds of substances into the vagina: pharmaceutical products, herbs (like wormwood and lovage), and other items believed to be abortifacients. They introduced objects like hairpins, crochet, knitting, and spinning needles,

[11] I have heard a story from my grandmother, who was a pediatrician, that one woman took two suitcases fully loaded with books and jumped off a table one hundred times.

and goose quills to perforate the cervix. Kligman (1998) notes that "the offspring who had clung so obstinately to life were frequently among the growing numbers of children who were physically and psychologically handicapped." And this can be the explanation for the large number of handicapped observed in the post June 1967 sample.

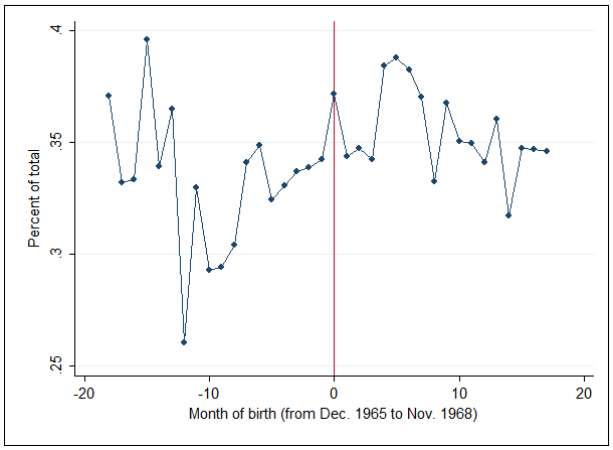
The *composition effect* is positive, just like in case of smoking. The explanation is the same too, according to this urban and more educated people are more probable to be handicapped.

Unfortunately the dataset contained very few observations about handicapped people. In the small sample there were 19 handicapped individuals born before June 1967 and 65 born after this date. Unfortunately this low number of observations does not allow for a thorough analysis, but the fact that the results are in accord with the initial hypothesis (that the abortion ban had a negative effect on health outcomes) is still a good sign.

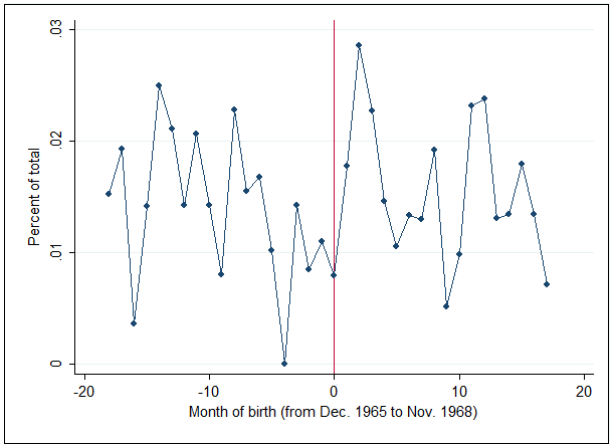
The results of the chronic disease outcome variable are the most surprising. In the small sample the effect of the abortion ban on the proportion of people with some kind of chronic disease is zero. In the middle sample it is large and negative (although still statistically not significant), while in the large sample it is even bigger, still negative and very statistically significant. This would mean that the abortion ban reduced the probability of a person suffering from some chronic disease by 0.9 percent from a mean of 3.8 percent. This is an enormous beneficial effect of the abortion ban, exactly the opposite of the initial hypothesis. Unfortunately I cannot even think of any explanation for it.

The results of equation (2) point to a negative *composition effect*, which confirms the suspicion that urban and educated people are less likely to suffer from some chronic disease.

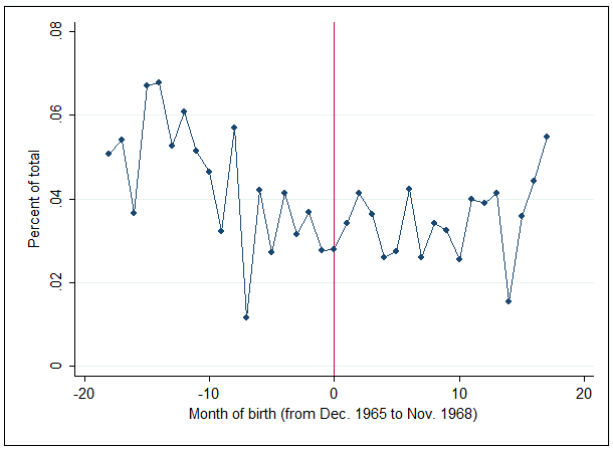
The graphical analysis confirms the regression results. In figure 5, panel A, it can clearly be seen that among those born after June 1967 there are more smokers than among those born before this date. Panel B shows that for three months after June 1967 there was a large spike in the proportion of handicapped children born, after which it has returned to its previous level. As for chronic diseases, the decrease occurred seven months before June 1967, after which it has stabilized at that lower level.




**Panel A: Smoke by month of birth**




**Panel B: Handicap by month of birth**




**Panel C: Chronic disease by month of birth**

**Figure 5: Average health outcome variables (smoke, handicap and chronic disease) by month of birth, raw data, for persons born between December 1965 and November 1968. Month 0 refers to June 1967 (large sample). Variables are defined in detail in Appendix table 9. Source: IHS**

# Chapter 5: Crowding effects extension

## 5.1 Crowding effects data and methodology

In this additional analysis I estimate the effect of the increased school grades on outcomes of the Children of the Decree. *Crowding effect* might be present because children in the the large cohort, that was born after the policy change had its effect on the birth rate, might have had a lower chance of being admitted to educational institutions since class sizes and numbers were limited (this is what Pop-Eleches confirms). Also, the Children of the Decree most probably had lower chances of finding jobs right after entering the labor market. This effect might have diminished with time, because they weren't just competing with those born right before them, they were competing with the whole Romanian labor force. So in this extension I will estimate whether there is any negative effect left later on in their lives that was caused by the large school grade they were enrolled in.

In this model children born between 1965 and 1967 are included. Following Pop-Eleches (2006), I exclude children born from September to December, to ensure that all those who were born in one year are actually enrolled in the same grade (the school enrollment cutoff date is September 15). Unfortunately the IHS dataset does not include the day of birth, so I decided to exclude everyone born in September. Moreover, since those born in May 1967 might already contain some unwanted children, everyone who was born in May is also dropped from the sample.

By looking at the summary statistics in table 6, it can be seen that the large school grade that consisted of those born between September 15, 1966 and September 15, 1967 had a higher proportion of unemployed and urban people in it, which did worse in terms of educational outcomes than the cohorts born before them. This still does not tell anything about the

**Table 6: Summary statistics of the crowding effect sample**

| Variable | Enrolled in previous two school grades | Enrolled in large school grade | Difference |
|---|---|---|---|
| Unemployed | .0946 | .1065 | .0120*** |
| Out of labor force | .1314 | .1393 | .0078 |
| Female | .5010 | .5126 | .0116 |
| City | .5397 | .5604 | .0207*** |
| Professional training | .3509 | .3699 | .0190*** |
| High school | .3902 | .3878 | -.0025 |
| Post high school education | .1133 | .1101 | -.0032 |

Note: The sample contains people born between January-April and June-August 1965-1967. Those born in 1967 are enrolled in the large school grade. Variables are defined in detail in Appendix table 9.
* Significant at the 10 percent level for the difference in means.
** Significant at the 5 percent level for the difference in means.
*** Significant at the 1 percent level for the difference in means.

*crowding effect*, because these statistics also include the *unwantedness effect* and the *composition effect*.

The model I estimate looks like the following:

$$OUTCOME_i = \gamma_0 + \gamma_1 \cdot after_i + \gamma_2 \cdot born(June - August)_i + \gamma_3 \cdot born(1967)_i + \gamma_4 \cdot X_i + \epsilon_i \quad (3)$$

This equation is almost the same as the extended framework equation of Pop-Eleches (2006). The only difference is that I have a *born(June-August)*$_i$ variable instead of *born(June-September)*$_I$, because I exclude those born in September to ensure that everyone is in the same grade. a*fter*$_i$ is the same treatment dummy as before, equal to one if a person was born after June 1967, zero otherwise; *born(June-August)*$_i$ is a dummy equal to one if individual was born between June and August, zero otherwise. *born(1967)*$_i$ is a dummy equal to one if person was born in 1967, zero otherwise. I interpret $\gamma_1$ as the *unwantedness effect*, once I have controlled for period of birth, the *composition effect* and the *crowding effect*, and $\gamma_3$ as the *crowding effect*. I also estimate this equation without control variables (without controlling for the *composition effect*) and repeat the exercise by sexes.

**Table 7: Regression results for crowding effect - log gross wage outcome**

| Variable | Coefficient | |
|---|---|---|
| BOTH GENDERS | | |
| Treatment dummy | .0184 | .0013 |
| | (.0189) | (.0171) |
| June-August dummy | -.0074 | -.0035 |
| | (.0126) | (.0113) |
| Crowding dummy | -.0224 | -.0116 |
| | (.0135) | (.0122) |
| FEMALE | | |
| Treatment dummy | -.0063 | -.0135 |
| | (.0271) | (.0249) |
| June-August dummy | -.0198 | -.0149 |
| | (.0178) | (.0164) |
| Crowding dummy | -.0241 | -.0194 |
| | (.0198) | (.0180) |
| MALE | | |
| Treatment dummy | .0332 | .0088 |
| | (.0251) | (.0235) |
| June-August dummy | .0039 | .0081 |
| | (.0169) | (.0156) |
| Crowding dummy | -.0180 | -.0038 |
| | (.0178) | (.0166) |
| Controls | No | Yes |

Note: The table presents the results of simple OLS regressions. The sample contains people born between January-April and June-August 1965-1967. The dependent variable is the logarithm of gross wage. The treatment dummy is one if person was born in or after June 1967, zero otherwise. The crowding dummy is one for people born in 1967, zero otherwise. The June-August dummy is one for people born between June and August, zero otherwise. The background controls included are three educational dummies, a city dummy for place of residence, a female dummy for sex of person, and four ethnicity dummies. Year of data gathering dummies always included. Robust standard errors are shown in parentheses. Variables are defined in detail in Appendix table 9.

* Significant at the 10 percent level

** Significant at the 5 percent level

*** Significant at the 1 percent level



### 5.2 Crowding effect results

Table 7 presents the estimates of equation (3) for the log gross wage outcome. The coefficient on the crowding dummy is small and not statistically significant. This is not surprising, because the overall effect of the abortion ban is also small (as presented in section 4.1), so if we take out the *unwantedness effect* and the *composition effect* there is not much remaining.

**Table 8: Regression results for crowding effect - labor market status outcomes**

| | Outcome variable | | | |
|---|---|---|---|---|
| | Unemployed | | Out of labor force | |
| BOTH GENDERS | | | | |
| Treatment dummy | -.0024 | .0012 | .0115 | .0146* |
| | (.0086) | (.0085) | (.0102) | (.0088) |
| June-August dummy | .0097* | .0080 | -.0083 | -.0081 |
| | (.0058) | (.0057) | (.0066) | (.0056) |
| Crowding dummy | .0116* | .0087 | .0031 | .0001 |
| | (.0064) | (.0062) | (.0072) | (.0061) |
| Observed probability | .0998 | .0998 | .1349 | .1349 |
| FEMALE | | | | |
| Treatment dummy | .0128 | .0129 | .0157 | .0234 |
| | (.0122) | (.0120) | (.0175) | (.0175) |
| June-August dummy | .0004 | .0001 | -.0116 | -.0152 |
| | (.0078) | (.0077) | (.0115) | (.0113) |
| Crowding dummy | .0000 | -.0001 | .0016 | .0007 |
| | (.0085) | (.0084) | (.0124) | (.0124) |
| Observed probability | .0914 | .0916 | .2277 | .2277 |
| MALE | | | | |
| Treatment dummy | -.0165 | -.0085 | .0037 | .0064 |
| | (.0121) | (.0120) | (.0081) | (.0076) |
| June-August dummy | .0184** | .0155* | -.0033 | -.0030 |
| | (.0085) | (.0083) | (.0052) | (.0047) |
| Crowding dummy | .0233** | .0162* | .0019 | .0013 |
| | (.0095) | (.0092) | (.0056) | (.0051) |
| Observed probability | .1083 | .1084 | .0398 | .0398 |
| Controls | No | Yes | No | Yes |

Note: The table presents the results of probit regressions. The coefficients capture the effect of switching the value from zero to one (since only dummies are used as independent variables). The sample contains people born between January-April and June-August 1965-1967. The dependent variables are labor market status dummies. The treatment dummy is one if person was born in or after June 1967, zero otherwise. The crowding dummy is one for people born in 1967, zero otherwise. The June-August dummy is one for people born between June and August, zero otherwise. The background controls included are three educational dummies, a city dummy for place of residence, and four ethnicity dummies. Year of data gathering dummies always included. Robust standard errors are shown in parentheses. Variables are defined in detail in Appendix table 9.

* Significant at the 10 percent level

** Significant at the 5 percent level

*** Significant at the 1 percent level



Table 8 also presents the estimates of equation (3), but for labor market status outcomes. For both genders jointly the *crowding effect* on the unemployment outcome is large but not very significant (0.8 percent from a mean of 9.9 percent). But once we repeat

the exercise separately for the two sexes the picture becomes clear. For women there is absolutely no *crowding effect* on unemployment. For men it is very large and very statistically significant (1.6 percent from a mean of 10.8 percent). Unfortunately I cannot think of any reason that would explain why there is a difference in the *crowding effect* between the two sexes.

For the out of labor force outcome variable all the crowding coefficients are zero, which means that school cohort size does not affect one's probability of being out of the labor force once grown up.

## Chapter 6: Conclusions

This paper estimated the effect of the Romanian abortion ban on labor market and health outcomes of children born after the policy change. On average, women born after the ban earn less than those born before. Children of both sexes born after the ban had a higher chance of being unemployed or out of the labor force as adults than children born prior to the policy change. Moreover, the analysis shows that they also smoke more and have a higher proportion of physically or mentally handicapped. A surprising and inexplicable result is that there are significantly fewer people suffering from chronic diseases among those born after the policy change. Additionally, I provide evidence that crowding in schools, due to the large increase in the birth rate right after the abortion ban, resulted in a higher unemployment of men. All these results are valid even after controlling for observable individual background characteristics.

While these results are based on the experience of only one country, broader conclusions can still be drawn. This paper gives further confirmation of the negative effect of abortion bans. It strengthens the already prevalent recommendation of researchers that every country should think twice before deciding to restrict abortions for the purpose of raising population growth, because it not only causes a lot of pain to the population, it also has a very negative effect on the children born in such restrictive regimes.

## Appendix

**Table 9: Variable descriptions**

| Variable | Definition |
|---|---|
| | A. Dependent variables |
| Labor market variables | |
| Log gross wage | Logarithm of individual's gross wage of previous month (including taxes) |
| Unemployed | 1 if individual is unemployed at the time of questioning, 0 otherwise |
| Out of labor force | 1 if individual is retired, student, housewife, military recruit, or out of the labor force because of some other reason at the time of questioning, 0 otherwise |
| Health variables | |
| Smoke | 1 if individual smokes at the time of questioning, 0 otherwise |
| Handicap | 1 if individual has some kind of handicap (physical or mental), 0 otherwise |
| Chronic disease | 1 if individual suffers from some kind of chronic disease (illness that requires permanent or continuous treatment for the rest of one's life), 0 otherwise |
| | B. Independent variables |
| Education variables[12] | |
| Professional training | 1 if individual's highest achieved schooling level is professional (4 years after elementary school), foreman (3 years after elementary school), or apprentice (2 years after elementary school) training, 0 otherwise |
| High school | 1 if individual's highest achieved schooling level is high school, 0 otherwise |
| Post high school education | 1 if individual's highest achieved schooling level is post high school professional training, college (3 or 4 years of higher education) or university (5 or more years), 0 otherwise |
| Ethnicity variables | |
| Hungarian | 1 if individual is Hungarian, 0 otherwise |
| Roma | 1 if individual is Roma, 0 otherwise |
| German | 1 if individual is German, 0 otherwise |
| Other nationality | 1 if individual is neither Romanian, Hungarian, Roma, or German, 0 otherwise |
| Other variables | |
| City | 1 if individual lives in a city at the time of the data gathering, 0 otherwise |
| Female | 1 if individual is female, 0 if male |

[12] The Romanian educational system during communism was organized into eight years of primary school (attended by almost everyone), after which students could choose to go to high school or attend either 4, 3, or 2 years of professional training. Only graduates of high schools were allowed to attend universities. Professional training classification taken from questionnaire.

## References


Angrist, Joshua D., and William N. Evans: "*Schooling and Labor Market Consequences of the 1970 State Abortion Reforms"*, Research in labor Economics, vol. 18, 1999, edited by Robst. Stamford, CT:JAI

Becker, Gary S.: "A Treatise on the Family", Cambridge, MA: Harvard Univ. Press, 1981

Becker, Gary S., and H. Gregg Lewis: "*On the Interaction between the Quantity and Quality of Children*" Journal of Political Economics 81, no.2, pt. 2 (March/April):S279-S288, 1973

Berelson, Bernard: "*Romania's 1966 Anti-abortion Decree: The Demographic Experience of the First Decade*" Population Studies 33 (July, 1979), pp.209-222

Central Intelligence Agency: "*The World Factbook 2009*". Washington, DC, 2009. Definitions and notes
https://www.cia.gov/library/publications/the-world-factbook/docs/notesanddefs.html#T

Charles, Kerwin Kofi and Melvin Stephens, Jr.: "*Abortion legalization and Adolescent Substance Use*" Journal of Law and Economics, vol. XLIX (October, 2006)

Donohue, John J. III, Jeffrey Grogger and Steven D. Levitt: "*The Impact of Legalized Abortion on Teen Childbearing*" Working paper, May 5, 2009

Donohue, John J. III and Steven D. Levitt: "*The Impact of Legalized Abortion on Crime*" The Quarterly Journal of Economics, Vol. 116, No. 2 (May, 2001), pp. 379-420

Grossman, Michael and Steven Jacobowitz: "*Variations in Infant Mortality rates among Counties of the United States: The Roles of Public Policies and Programs*" Demography 18 (November 1981), pp. 730-70.

Grossman, Michael and Theodore J. Joyce: "Unobservable, Pregnancy Resolutions, and Birth Weight Production Functions in New York City" Journal of Political Economy 98, no. 5, pt. 1, (October 1990), pp.983-1007

Gruber, Jonathan, Phillip Levine and Douglas Staiger: "*Abortion Legalization and Child Living Circumstances: Who is the "Marginal Child"?*" The Quarterly Journal of Economics, Vol. 114, No. 1 (Feb., 1999), pp. 263-291

Heinsohn, Gunnar and Otto Steiger: "*Birth Control: The Political-Economic Rationale behind Jean Bodin's Demonomanie*" History of Political Economy, 1999, 31:3

Iepan, Florin: "*Children of the Decree"*, 2005, documentary

Joyce, Theodore J.: "The *Impact of Induced Abortion on Birth Outcomes in the U.S.*" Working Paper no. 1757 (October 1987), NBER, Cambridge, MA

Kligman, Gail: "*The Politics of Duplicity: Controlling Reproduction in Ceausescu's Romania*" University of California Press, 1998

Levitt, Steven D. and Stephen J. Dubner: "*Freakonomics*" Penguin Books, 2009

Nichols, H. B. and B. L. Harlow: "Childhood abuse and risk of smoking onset" Journal of Epidemiology and Community Health, 2004, Vol. 58, No. 5, pp. 402-406

Pop-Eleches, Cristian: "*The Impact of an Abortion Ban on Socioeconomic Outcomes of Children: Evidence from Romania*" Journal of Political Economy, 2006, vol. 114, no. 4

World Bank: "*Romania: Human Resources and the Transition to a Market Economy*" Washington, DC: World Bank, 1992