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Master in Economics: Empirical Applications and Policies

Master's Thesis:

The Effect of a Newborn on Spanish Households Expenditure

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Abstract

This article aims to carry out an analysis of the effects of a newborn on Spanish households expenditure in 2014 and 2015. A standard difference-in-differences (DID) estimator would then compare the change in expenditure of those households that have a child in the second period with those that do not. However, both groups of households are different in characteristics that affect household expenditure. The semi-parametric difference-in-differences (SDID) estimator proposed by Abadie (2005) provides a simple two-step procedure to account for non-parallel trends and has been implemented into Stata software by Houngbedji (2016). Our results show that there is a positive effect on the allocation of income that households spend on raising children.

Keywords: Household Expenditure, Newborn, Semi-parametric Difference-in-differences.

1 Introduction

Beyond describing what had happened during the years 2014 and 2015, this research wants to show that it could be useful to update the debate on what kind of family assistance policies would be better used. The introduction of the minimum vital income by the Spanish Ministry of Social Rights and Agenda 2030 due to the crisis caused by the coronavirus is a hot topic nowadays. This is a non-contributory social security benefit that guarantees a minimum income to those who lack it. The amount to be received by an adult without children is 462 euros and when having a child, this amount increases to 700 euros. This implies an increase of 238 euros. Bearing in mind that

the data that this research uses is from the Household Budget Survey, it represents an average of what Spanish families spend. Then, it would be good to know if this difference is reflected in what is published by this governmental organism.

Furthermore, the author's motivation lies in the fact that it is a great opportunity to carry out this study to put into practice the knowledge acquired in Causal Inference for the Social Sciences subject. As is the case of the Difference-in-differences estimator which is generally used in the economic literature to identify the effects of public policy interventions.

For this purpose, to analyze the effect of a newborn on household expenditure, a standard difference-in-differences analysis would then compare the change in the expenditure of those households that have a child in the second period with those that do not. However, both groups of households are different in characteristics that affect household expenditure. Therefore, the change in those outcomes is unlikely to be the same for both types of households even if both groups had no children in the second period. In other words, the parallel trends assumption needed for consistency of the difference-in-differences estimates does not hold. The Semi-parametric Diff-in-Diff estimator proposed by Abadie (2005) provides a simple two-step procedure to account for non-parallel trends. Our results show that there is a positive effect on the allocation of income that families spend on raising children. That is, as people have children household expenses increase.

The remainder of this article is organized as follows: *Section 2*, we can observe the existing review literature. Then, in *Section 3* we have developed the model to be analyzed. *Section 4* describes the data and statistics to deep about the situation of Spain during 2014-2015. *Section 5* shows the results and *Section 6* concludes. A technical Appendix at the end of the document gathers tables and graphs.

2 Literature Review

There is a vast economic literature on the amount of money that families can receive concerning child payments or child allowances made by the government. In addition, there is a lot of information about how much money people spend on their budget through surveys, but technical studies on the effect of having a new child on household expenditure are not easily found. Next, in this section, we are going to mention some papers that have served as a guide for this research.

First of all, Deaton et al. (1989) measure the costs and effects of having children on household expenditure in Spain. They proposed the concept of demographic separability that formalizes the idea that there are groups of goods with little or no relationship to a specific set of demographic variables. For instance, the most important example is the existence of adult goods that are demographically separable from children's characteristics. This paper concludes that an additional baby is calculated to be equivalent to 21 percent of an adult, an additional of 5-8-year-old is 22 percent of an adult, and an additional 9-13-year-old 31 percent of an adult. Nevertheless, when they dropped out variables such as education and health, the costs are a little higher but increase to only 24 percent, 24 percent, and 35 percent, respectively.

Brandrup and Mance (2010) analyze a panel data of an Australian survey to examine family expenditure patterns for three types of couple families who experienced the birth of a child between 2006 and 2007 - those experiencing the birth of a first child, second child, or third and subsequent children. The methodology they used was the fixed effects regressions to analyze the impact of the arrival of newborn children while controlling for several time-varying independent variables. They concluded that parents of first-born children increase expenditure on health care in 623.66 dollars and clothing in 424.21 dollars, both of them are significant at 1%. Also, parents of second-born children increase expenditure on health care by 544.01 dollars, and on meals eaten out and takeaway had a increase of 375.50 dollars; however, they decrease expenditure on child care by 30.82 dollars. Finally, those parents of third and subsequent born children increase expenditure on health care by 589.71 dollars as well as on electronic goods by 541.71 dollars. In sum, when they considered all variables together, these results indicate that parents adjust their spending in response to the birth of their baby.

Measuring the causal impact of fertility on Madagascar household welfare using gender of the two first-born children as a source of exogenous variables, Kuepie (2018) showed that an exogenous increase in fertility reduces the total per capita consumption. Taking into account the context of a country characterized by an endemic high level of poverty that affects nearly three-quarters of the population, it is shown that all consumption items are negatively affected by the impact of the fertility burden, and this detrimental effect occurs at any quantile of the living standard distribution.

3 The Model

Firstly, we have to define the concept of difference-in-differences estimator (DID) which measures the effect of a treatment imposed on a group of the sample denominated "treated group" while the other group does not receive the treatment, the latter is called the "control group". In other words, the DID method estimates the difference in the mean potential outcome of the treated before and after treatment minus the difference in the mean potential outcome of the control group before and after treatment as well.

To illustrate this point, this estimator is generally used to identify the effect of public policy interventions. One of the most mentioned works is the article of Card and Krueger (1994) which assesses the employment effects of a raise in the minimum wage. Moreover, we have the paper of Duflo (2001) that explains the effect of investment in public school infrastructure on the scolarity and wages in Indonesia.

Next, we establish the main question for our research. Does a newborn affect Spanish households expenditure?

Our goal is to estimate the average effect of treatment on the treated (ATT):

$$ATT = E[Y^1(1) - Y^0(1)|D = 1], \tag{1}$$

where $Y^d(t)$ is the potential outcome given treatment d at time t. So, $t = 1$ stands for the post-treatment period, $d = 1$ represents treatment and $d = 0$ represents no treatment. Consequently, $Y^1(1)$ is the value of the potential outcome after treatment at time $t = 1$, $Y^0(1)$ is the value of the potential outcome under no treatment at time $t = 1$, and $\boldsymbol{D}$ is an indicator of whether or not the individual has **received treatment** at time $t = 1$.

However, $Y^0(1)$ is never observed for a treated group, thus posing a problem of estimating the ATT. The economic literature calls *factual* to the potential outcomes with treatment that can be observed and *counterfactual* to the potential outcomes with no treatment which cannot be observed, in the treated group.

The DID method requires a strong parallel trends assumption. That is, in absence of treatment, the trend in outcome would be the same in the treatment and control groups. However, empirical evidence shows us that this assumption often cannot be fulfilled. Likewise, as Zeldow and Hatfield (2019) pointed out that many papers use diff-in-diff methodology to have a line or two stating the assumption of "parallel trends" without much further elaboration. The parallel trends assumption

is violated when there is differential time evolution in covariate distributions between the treatment and control populations.

Abadie (2005) proposes the semi-parametric difference-in-difference method when a pre-treatment covariate differs by treatment status and also affects the dynamics of the outcome variable. This is the case when a covariate $\boldsymbol{X}$ is associated with both treatment and outcomes, then the parallel trends no longer hold. The semi-parametric difference-in-differences method requires the following weaker assumption:

- Conditional Parallel Trends Assumption:

$$E[Y^0(1) - Y^0(0)|D = 1, X(0)] = E[Y^0(1) - Y^0(0)|D = 0, X(0)] \tag{2}$$

  This assumption means that the change in outcomes from pre- to post-intervention in the control group is a good proxy for the counterfactual change in untreated potential outcomes in the treated group, conditional on the covariates.

The propensity score is the probability of treatment given pre-treatment covariates, $P(D = 1|X)$. Therefore, it is necessary to establish another assumption:

- Common Support:

$$0 < P(D = 1|X) < 1 \tag{3}$$

  This assumption means that for each value of the covariates, the probability of receiving treatment is strictly positive and strictly smaller than one.

Hence, let us consider the weighted estimator proposed by Abadie (2005):

$$E[Y^1(1) - Y^0(1)|D = 1] = E\left[\frac{Y(1) - Y(0)}{P(D = 1)} \times \frac{D - P(D = 1|X)}{1 - P(D = 1|X)}\right] \tag{4}$$

To implement this estimator, first we have to generate fitted probabilities or fitted values of propensity scores for each unit, $\hat{P}(D = 1|X = x_i)$, and then we use sample averages in the treated and control groups. Therefore, we have an average change in outcomes on the treated group and the weighted average change in outcomes among the control group. The weights $\frac{\hat{P}(D=1|X=x_i)}{1-\hat{P}(D=1|X=x_i)}$ are used to weighting-down the distribution of the outcomes change, *(Y(1) – Y(0))*, of the untreated for those values of the covariates which are over-represented among the untreated, and weighting-up for those values of *Y(1) – Y(0)* the covariates under-represented among the untreated.

In short, Abadie (2005) suggests a simple two-step method to estimate the ATT:

1. Estimate the propensity score, $P(D = 1|X)$, and compute the fitted values for the sample.
2. Plug the fitted values into the sample analog of Equation (4) to obtain an estimate of the ATT.

4 Data and Sample

In this section, we analyze the data provided by the National Institute of Statistics (INE, by its Spanish acronym) available on its web page[1]. Specifically, the Spanish Household Budget Survey for 2014 and 2015. First, we will describe the data processing and then some of the tables and graphs about the descriptive statistics will be given.

4.1 Data Processing

- *Import and Merge the data*

  First of all, we have downloaded the Spanish Household Budget Survey from the National Institute of Statistics web page, from now on INE by its Spanish acronym, for 2014 and 2015. Then, we imported the data into the Stata software using a dictionary where it was necessary to read the manual provided by the INE. There are 3 files: members, households, and expenditures containing information about 22,146 households in 2014 and 22,130 households in 2015.

  Secondly, we have to merge the three files into a single. In addition, we have aggregated the expenditures on the 255 items into 12 groups.

  Finally, we have linked the files between 2014 and 2015 and selected just those households that were interviewed in 2014 and 2015. Those families interviewed only one year were eliminated.

[1]National Institute of Statistics web page:`https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176806&idp=1254735976608`

- *Restriction and Treatment*

  Thirdly, we have restricted the sample to those households with at least one member who is less than 45 years old in 2014. We do so to eliminate those households in which there are only elderly people who cannot have children. We then assume that those who are under 45 years old have the possibility of having a child in the following year of the survey. For this reason, the number of observations for both years was reduced to 5,952 households.

  We consider two treatments. For the first treatment, we identify a household as treated if no member is less than 18 years old in 2014 and the number of household members in the 0-4 years interval increases between 2014 and 2015. This is the case in which the family has no children in 2014 and 2015, it has one or more children. For the second treatment, we identify a household as treated if there is just one member less than 18 years old in 2014 and the number of household members in the 0-4 years interval increases between 2014 and 2015. This is the case when a household has a second child (or more).

- *Estimation*

  Houngbedji (2016) has implemented the semi-parametric difference-in-differences (SDID) estimator of Abadie (2005) through the "absdid" stata command. It estimates the average treatment effect on the treated (ATT) by comparing the change over time of the outcome of interest across treatment groups. Also, it adjusts for differences between treatment groups on the observable characteristics.

  Following the syntax of Houngbedji (2016), it is required to mention first the dependent variables are the change observed in the total expenditures and also the changes by type of disaggregated expenditure, whose descriptive data can be seen in the following subsection. Secondly, we used the dummy variables corresponding to Treatment 1 and Treatment 2, these take values of 0 and 1 as we mentioned above.

  Third, we include the list of covariates that can be useful to explain the model. To select this list of covariates it was necessary to previously calculate the propensity score. We used the series logit estimator which the results can be seen in Appendix I. Also, it is necessary to mention that we have eliminated those observations of the propensity score of less than 0.005 as we can observe in the figures 2 and 3 of common support (see Appendix II). This was to discard observations with very small propensity scores.

4.2 Descriptive Statistics

In this part, we want to summarize the characteristics of households before and after the treatment. First, we describe the Household Budget Survey (HBS, henceforth) to identify the variables that are available to be analyzed. Then, we analyze the average household expenditure over the two years to get an idea of how they allocate their income. Finally, we look at the statistics on the variables used to estimate the model.

The HBS provides annual information about consumer expenditure as well as characteristics relating to the living conditions of households. Consumption expenditure refers both to the money flow that the household allocates to the payment of certain final consumption goods and services, and the value of the goods received for self-consumption, self-supply, wages, free or subsidized meals, and imputed rent for the dwelling in which the household resides (when it is the owner of the dwelling or has it assigned by other households or institutions). The expenses are recorded at the time of the acquisition, regardless of whether the payment is in cash or installments.

The methodology established by the INE summarizes the data in three types of files: membership, households, and expenditures. The first file has information about the characteristics of the individuals who are part of the household. It has 33 variables that describe the age, sex, nationality, marital status, employment status, or total income of the members, among others. Table 1 summarizes the number of observations and individuals that were interviewed in both years as well as the represented population.

Table 1: Description of the Database

Survey (Year)	Number of Households	Individuals
2014	22,146	60,394
2015	22,130	59,517

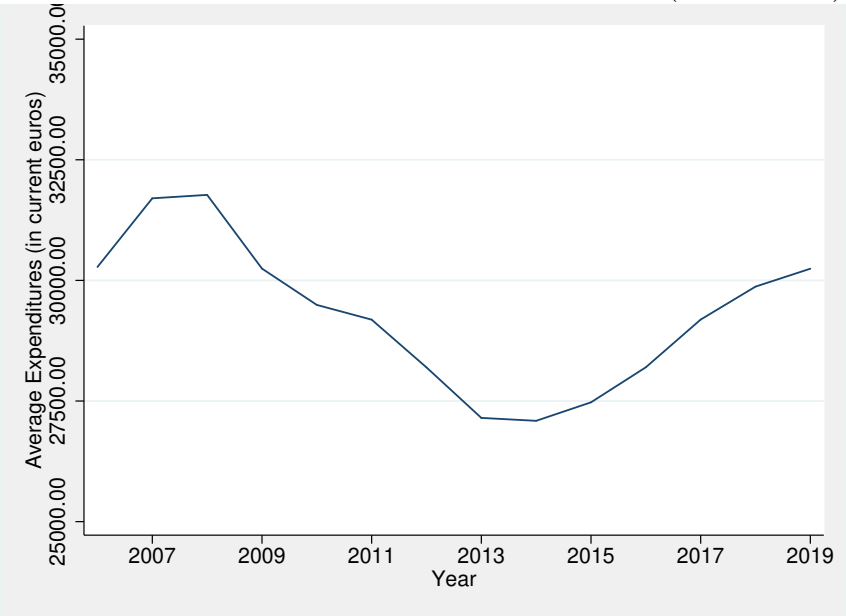
Source: National Institute of Statistics.

The household file contains information about the characteristics of the house, where is located (region and autonomous community), size of the city, number of household members, and details about the house such as what type of source of energy or type of building or residence, among others things. This file has 191 variables. Finally, we have the expenditure file which shows us the destination of the income of Spanish families. It has only 13 variables where we can obtain the amount of expenditures in monetary terms as well as non-monetary terms. There are 255 items of

each type of expenditures which are grouped in 12 groups.

Figure 1 shows us the evolution of average expenditure per household. It tells us that families spend on average 27,089.83 euros per household in 2014 while 27,473.04 has been the amount for 2015. As we can see, 2014 has been the year where the average expenditure reached its lowest point. Spain continues recovering but has not reached yet the peak of 2008 when families spent an average of 31,772.62 per household. Accordingly, we can provide that in 2019 it reached 30,242.76 euros on average per household.

FIGURE 1: AVERAGE EXPENDITURE IN SPAIN (2006-2019)



Source: National Institute of Statistics.

These data represent the average in Spain, without restrictions or treatments for this research. Drawing from the survey, Table 2 shows the change in average household expenditure in the years 2014 and 2015. We can see that the expenditures behaved relatively stable, for example one of the biggest variations was in expenditures for Restaurants and Hotels which increased by 8.98% while furniture and other household goods which had an increase of almost 6%. Concerning spending on food increased 2.41 percent from one year to the next. However, we can see that spending on transport decreased from by 2.14%. Another interesting point that we can appreciate in this table is the quantity of money that people spend on water, electricity, gas, and other fuels.

Thereafter, we are going to describe the statistics of the variables selected for the model. However, it is worth noting that the number of observations was reduced to 5,952 due to the

Table 2: Changes in the Average Household Expenditure.

Expenditures	2014	2015	Difference
01 Food and non-alcoholic drinks	4,028.21	4,125.43	2.41%
02 Alcoholic drinks and tobacco	509.35	522.22	2.53%
03 Clothes and shoes	1,375.75	1,395.27	1.42%
04 Housing, water, electricity, gas and other fuels	8,751.02	8,714.49	-0.42%
05 Furniture, household goods and other items	1,099.99	1,164.95	5.91%
06 Health	954.74	971.98	1.81%
07 Transport	3,227.06	3,158.07	-2.14%
08 Communications	793.23	791.98	-0.16%
09 Leisure and culture	1,532.81	1,593.08	3.93%
10 Education	395.86	407.42	2.92%
11 Restaurants and hotels	2,383.03	2,597.01	8.98%
12 Other goods and services	2,038.78	2,031.15	-0.37%

Source: National Institute of Statistics.

restrictions and treatment we have established in the previous section. That is, we eliminated those households that were interviewed only once so that the sample was reduced to 9,246 observations. We then said that we would take into account only those households where at least one member is under 45 years old.

Diving into our data, we can find the number of households that fulfill the requirements reduced to 70 observations for the Treatment 1 and 64 households for the Treatment 2. In other words, 70 households had no children in 2014 and they have had one or more children in 2015. Likewise, 64 households already have one or more children in 2014 and they have had another child in 2015. As we can see in Table 3, they take values of 0 and 1.

Table 3: Descriptive Statistics for the Treatments.

	Obs	Untreated	Treated	Mean	Std. Dev.	Min	Max
Treatment 1	5,952	5,882	70	0.01	0.11	0	1
Treatment 2	5,952	5,888	64	0.01	0.10	0	1

Source: National Institute of Statistics.

Next, we have the descriptive statistics for the outcome variables. That is, the difference between the total expenditure for 2015 minus the total expenditure for 2014 as the first main outcome. Then, we have another 12 outcomes that correspond to those groups of expenditure, by calculating firstly the difference between years.

In Table 4, we can see the descriptive statistics for the outcomes variables which are the expenditures gap between 2014 and 2015. The "Total Expenditures" refers to the sum of all the types of expenditure groups, which are disaggregated into the following rows. Among the most outstanding data of the 5,952 observations in our sample, it is estimated that the variation in total expenditures will be 868.31 euros.

The type of expenditure groups that have the highest expected averages are Restaurants and hotels, Leisure and culture, and Food and non-alcoholic drinks. The largest standard deviation is seen in Transport, Restaurants and hotels, and Health.

Table 4: Descriptive Statistics for the Outcomes

Outcome*	Obs	Mean	Std. Dev.	Min	Max
Total Expenditures	5,952	868.31	12,523.52	-132,235.9	77,516.17
Food and non-alcoholic drinks	5,952	100.03	3,077.30	-41,417.82	75,391.49
Alcoholic drinks and tobacco	5,952	29.13	931.51	-17,819.84	26,283.32
Clothes and shoes	5,952	85.99	2,626.83	-34,204.11	37,067.34
Housing, water, electricity, gas and other fuels	5,952	56.88	2,459.23	-21,585.6	29,113.15
Furniture, household goods and other items	5,952	-45.02	2,053.28	-23,416.82	30,611.38
Health	5,952	39.22	3,203.65	-48,542.58	41,711.07
Transport	5,952	62.40	7,126.62	-50,129.81	46,733.66
Communications	5,952	10.72	528.69	-10,718.47	5,648.71
Leisure and culture	5,952	122.83	2,764.43	-29,747.68	36,849.38
Education	5,952	0.45	1,496.76	-33,662.89	36,497.3
Restaurants and hotels	5,952	309.86	3,460.76	-38,795.12	51,732.46
Other goods and services	5,952	95.80	3,169.46	-71,200.51	60,567.2

* The outcomes represent the gap between years.

Source: National Institute of Statistics.

Subsequently, it is necessary to select some control variables that help us to estimate the propensity score. For that reason, we have selected the following list of variables exposed in Table 5. They can be either continuous or binary variables.

Table 5: Descriptive Statistics of the Covariates in 2014

Variables	Obs	Mean	Std. Dev.	Min	Max
Panel A: Characteristics of Geographical Location					
Autonomous Community*	5,952	8.99	5.05	1	19
Province*	5,952	4.41	2.33	1	6
Size of the city	5,952	2.72	1.59	1	5
Density*	5,952	1.83	0.84	1	3
Panel B: Households Characteristics					
Number of individuals under 18	5,952	0.84	0.94	0	9
Number of individuals between 0-4 years old	5,952	0.21	0.49	0	4
Number of members in a house	5,952	3.30	1.09	1	6
Dependent children	5,952	1.04	0.98	0	9
Age (Main Breadwinner)	5,952	47.77	11.91	17	85
Age (Spouse)	4,740	45.83	10.88	19	85
Nacionality (Main Breadwinner)	5,952	1.11	0.38	1	3
Nacionality (Spouse)	4,740	1.13	0.40	1	3
Education (Main Breadwinner)	5,952	2.80	1.03	1	4
Education (Spouse)	4,740	2.81	1.02	1	4
Laboral status (Main Breadwinner)	5,952	1.15	0.36	1	2
Laboral status (Spouse)	4,740	1.28	0.45	1	2
Ocupation (Main Breadwinner)	5,952	1.25	0.44	1	2
Panel C: Home Characteristics					
Tenure status*	5,952	1.94	1.10	1	6

* dummy variable

Source: National Institute of Statistics.

5 Results

Table 6 shows estimates of change in expenditure during 2014 and 2015 for a household that had a child in that period. The dependent outcomes are presented in the first column of the table and include the change in expenditure at an aggregate level and then, by groups of expenditures. The effect of the arrival of a newborn increases expenses but they are not significant at the aggregate level for Treatment 1. However, there is an interesting result on the effect for Treatment 2 where we can notice that the arrival of a second child made the expenses increase by 3,219 euros in one year and it is significant at 10%. That is, the Spanish families allocate their income more than three thousand euros on average for having another child.

Table 6: Effect of Newborn on Household Expenditure

	Treatment1		Treatment2	
Outcomes	ATT	p-value	ATT	p-value
Total of Expenditures	368.69	0.848	3,219.21	0.073*
	(1,922.65)		(1,795.00)	
Number of households	887		817	

Notes: Standard errors are in parenthesis. Significance levels are denoted as follows:

* p<0.10, ** p<0.05, and *** p<0.01.

Source: National Institute of Statistics.

According to the data, food expenses increased by 905 euros on average due to the arrival of the first child for treatment 1. While for the second or third child, expenses increased by 1,238 euros. This is closely related to the expectation that the arrival of one more member of the family will increase the expenditure on foods. Also, it coincides with Table 2 where we can see an increase in average expenditure in Spain. In addition, we can observe that families spend 256.12 euros more than those without children. With respect to clothing and shoes, there was an increase in both years. That is, those families that had children increased their level of expenses by 529 and 520 euros taking into account for treatment 1 and 2.

An increase of 1,145.81 euros can be noted in those household expenses such as water, electricity or other services. This also coincides with Table 2 where it can be seen that families spend a large percentage of their income on this item. Having a second child substantially increases the level of this type of expenditure and this result is significant at 10

Table 7: Effect of Newborn on Household Expenditure

	Treatment1		Treatment2	
Outcomes	ATT	p-value	ATT	p-value
01 Food and non-alcoholic beverages	905.40	0.030**	1,238.66	0.001***
	(416.68)		(359.03)	
02 Alcoholic drinks and tobacco	256.12	0.033**	-14.47	0.873
	(120.09)		(90.80)	
03 Clothing and shoes	529.13	0.108	520.79	0.229
	(328.93)		(432.98)	
04 Housing, water, electricity,	340.28	0.203	1,145.81	0.079*
	(267.22)		(652.45)	
05 Furniture, household goods	355.10	0.324	225.48	0.488
	(360.22)		(324.89)	
06 Health.	-200.38	0.629	-81.37	0.767
	(414.73)		(274.50)	
07 Transport	701.34	0.614	13.18	0.992
	(1,391.88)		(1,251.13)	
08 Communications	50.22	0.509	-117.53	0.145
	(76.09		(80.56)	
09 Leisure and culture	-967.28	0.106	-4.99	0.989
	(598.26)		(354.54)	
10 Education	-25.15	0.760	-344.45	0.004***
	(82.38		(121.22)	
11 Restaurants and hotels	-1,461.52	0.087*	-245.33	0.528
	(853.96)		(388.30)	
12 Other goods and services	-114.56	0.807	883.43	0.010**
	(468.60)		(344.86)	
Number of households	887		817	

Notes: Standard errors are in parenthesis. Significance levels are denoted as follows: *p<0.10, **p<0.05, and ***p<0.01.

Source: National Institute of Statistics.

Table 7 describes another group of expenditures. The transport outcome variable had an increase of 701.34 euros when families had the first child but it has not had a significant increase for the second child that was 13 euros. However, we can see that families who had children in 2015 reduced expenditures in Restaurants and Hotels by 1,461 euros on average and this effect is significant. Furthermore, we can see that the expenses in Leisure and Culture also decreased with the newborn.

6 Conclusion

People often hear that having children entails costs but actually we do not know how much exactly it is. This article evidences the effect of a newborn on Spanish household expenditures during the years 2014 and 2015. Our results reflect that there is a positive effect on the allocation of income that families spend on raising children. That is, as people have children household expenses increase. Specifically, having a child increase the expenditures by 368.69 euros but having another child increase 3,219.21 euros according to the data provided by the Household Budget Survey from the National Institute of Statistics.

To be more precise, we focused on 12 expenditure groups to clarify the allocation of household income. For this reason, we found that families have spent more on food, alcoholic and non-alcoholic drinks, clothes and shoes, and especially on those items related to public services such as water, electricity, and other things. However, the arrival of a new child decreased spending on items such as health, leisure and culture, education, and restaurants and hotels. This is further evidence that the results show how Spanish families are going through. Although the government invests in policies aimed at large families, they still spend a large percentage on public services.

The contribution of this article lies in updating the debate on what families spend on. The technique proposed by Abadie (2005) allows us to carry out this type of analysis which helps policy-makers to decide based on scientific evidence. The final goal is to improve the living conditions of families and the data help us to reach it.

Despite having children implies emptying bank deposits, the most important thing is the allocation of that income. As Charles R. Swindoll says: "Each day of our lives we make deposits in the memory banks of our children", alluding to the fact that the moments we live with our children will always be remembered by them.

7 References

Abadie, A. (2005). Semiparametric difference-in-differences estimators. *Review of Economic Studies*, 72, p. 1-19. Retrieved from:https://economics.mit.edu/files/11869

Brandrup, J. D., & Mance, P. L. (2010). Changes in Household Expenditure Associated with the Arrival of Newborn Children. *Australian Social Policy Journal*(9), p. 41-66. Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1636050

Card, D., & Krueger, A. B. (1994). Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania. *American Economic Review*, 84(4),p. 772-793. Retrieved from: https://davidcard.berkeley.edu/papers/njmin-aer.pdf

Deaton, A. S., Ruiz-Castillo, J., & Thomas, D. (1989). The Influence of Household Composition on Household Expenditure Patterns: Theory and Spanish Evidence. *Journal of Political Economy*, 97(1), p. 179-200. Retrieved from: https://www.researchgate.net/publication/24108624_The_Influence_of_Household_Composition_on_Household_Expenditure_Patterns_Theory_and_Spanish_Evidence

Duflo, E. (2001). Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment. *Massachusetts Institute of Technology*, p. 1-60. Retrieved from: https://economics.mit.edu/files/726

Houngbedji, K. (2016). Abadie's semiparametric difference-in-differences estimator. *The Stata Journal*, 2(16), p. 482-490. Retrieved from: https://med.mahidol.ac.th/ceb/sites/default/files/public/pdf/stata_journal/sj16-2.pdf#page=244

Kuepie, M. (2018), Does family size hinder family living standards? Evidence from a quasi-experiment in Madagascar, *AFD Research Papers Series*, 85. Retrieved from: https://www.afd.fr/en/ressources/does-family-size-hinder-family-living-standards-evidence-quasi-ex

National Institute of Statistics (INE). (2016). *Instituto Nacional de Estadísticas*. Encuesta de Presupuestos Familiares (EPF) 2014-2015. Retrieved from: https://www.ine.es/

Spanish Ministry of Social Rights and Agenda 2030. (2020). *Ministerio de Derechos Sociales y Agenda 2030*. Ingreso Mínimo Vital. Retrieved from: https://www.mscbs.gob.es/ssi/covid19/ingresoMinVital/home.htm

Zeldow, B., & Hatfield, L. (2019). *Health Policy Data Science*. Difference-in-differences. Retrieved from: https://diff.healthpolicydatascience.org/#semiparametric

8 Appendix

8.1 Appendix I

Table 8: Characteristics of Households across Treatments for Expenditures.

Variables	Entire Sample	Treated	Untreated	Difference
Having a child in 2015 (Treatment 1)	0.01			
	[0.11]			
Expenditures variables:				
Expenditures in 2015	32,045.93	31,676.34	32,050.32	-373.98
	[17,570.26]	[15,515.07]	[17,594.39]	(2,112.68)
Expenditures in 2014	31,177.62	30,907.61	31,180.83	-273.22
	[17,052.03]	[16,539.59]	[17,059.38]	(2050.37)
Number of Households	5,952	70	5,882	5,952

Notes: Standard deviations are in brackets. Standard errors are in parenthesis.

Significance levels are denoted as follows: * p<0.10, ** p<0.05, and *** p<0.01.

Source: National Institute of Statistics.

Table 9: Characteristics of Households across Treatments for Outcomes.

		Entire Sample	Treated	Untreated	Difference	
Outcome variables:						
01	D_Expenditure01	100.03	947.91	89.94	857.97	**
		[3,077.30]	[2,442.33]	[3,082.83]	(369.85)	
02	D_Expenditure02	29.13	176	27.38	148.62	
		[931.51]	[721.61]	[933.63]	(111.99)	
03	D_Expenditure03	85.99	527.58	80.74	446.83	
		[2,626.83]	[1,777.85]	[2,634.95]	(315.80)	
04	D_Expenditure04	56.88	443.63	52.28	391.36	
		[2,459.23]	[1,879.94]	[2,465.06]	(295.66)	
05	D_Expenditure05	-45.02	-106.06	-44.29	-61.77	
		[2,053.28]	[2,356.5]	[2,049.62]	(246.89)	
06	D_Expenditure06	39.22	874.75	29.28	845.47	**
		[3,203.65]	[4,131.11]	[3,190.13]	(385.06)	
07	D_Expenditure07	62.40	-624.74	70.58	-695.32	
		[7,126.62]	[9,966.64]	[7,086.75]	(856.87)	
08	D_Expenditure08	10.72	32.79	10.45	22.34	
		[528.69]	[524.89]	[528.77]	(63.57)	
09	D_Expenditure09	122.83	-734.47	133.04	-867.51	***
		[2,764.43]	[3,954.31]	[2,746.04]	(332.21)	
10	D_Expenditure10	0.45	-9.11	0.56	-9.67	
		[1,496.76]	[423.6]	[1,504.94]	(179.97)	
11	D_Expenditure11	309.88	-951.31	324.87	1,276.18	***
		[3,460.76]	[5,871.1]	[3,419.91]	(415.80)	
12	D_Expenditure12	95.80	191.75	94.66	97.09	
		[3,169.46]	[3,120.76]	[3,170.28]	(381.10)	
Number of Households		5,952	70	5,882	5,952	

Notes: Standard deviations are in brackets. Standard errors are in parenthesis.

Significance levels are denoted as follows: * p<0.10, ** p<0.05, and *** p<0.01.

Source: National Institute of Statistics.

Table 10: Characteristics of Households across Treatments for Covariates

Variables	Entire Sample	Treated	Untreated	Difference	
Having a child in 2015 (Treatment 1)	0.01				
	[0.11]				
Covariates in 2014					
Age (Main Breadwinner)	47.77	38.1	47.89	-9.79	***
	[11.90]	[11.11]	[11.87]	(1.43)	
Age (Spouse)	45.83	35.11	45.97	-10.86	***
	[10.88]	[9.35]	[10.83]	(1.38)	
Dependent Children	1.04	0.10	1.06	-0.95	***
	[0.98]	[0.35]	[0.97]	(0.12)	
Number of Members in a House	3.30	2.24	3.32	-1.07	***
	[1.09]	[0.69]	[1.08]	(0.13)	
Number of Households	5,952	70	5,882	5,952	

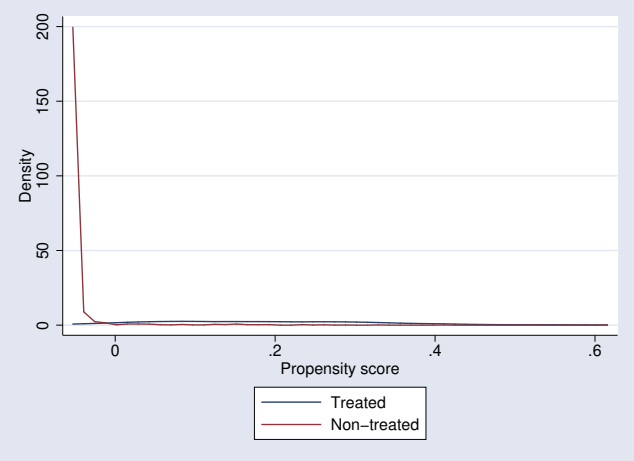
Notes: Standard deviations are in brackets. Standard errors are in parenthesis.

Significance levels are denoted as follows: * p<0.10, ** p<0.05, and *** p<0.01.

Source: National Institute of Statistics.

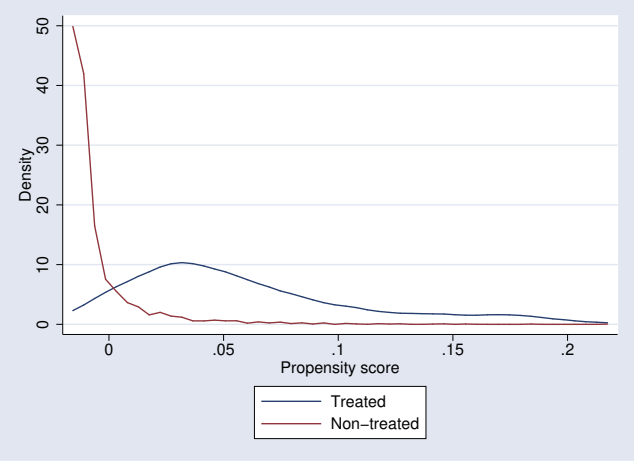
8.2 Appendix II

Figure 2: Kernel Density Estimation of Treatment Group.



Source: National Institute of Statistics.

Figure 3: Kernel Density Estimation of Control Group.



Source: National Institute of Statistics.