HOW COSTLY ARE LABOR GENDER GAPS? ESTIMATES BY AGE GROUP FOR THE BALKANS AND TURKEY

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How Costly Are Labor Gender Gaps? Estimates by Age Group for the Balkans and Turkey[*]

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Abstract

In this paper, survey data are used to document the presence of gender gaps in self-employment, employership, and labor force participation in seven Balkan countries and Turkey. The paper examines the quantitative effects of the gender gaps on aggregate productivity and income per capita in these countries. In the model used to carry out this calculation, agents choose between being workers, self-employed, or employers, and women face several restrictions in the labor market. The data display very large gaps in labor force participation and in the percentage of employers and self-employed in the labor force. In almost all cases, these gaps reveal a clear underrepresentation of women. The calculations show that, on average, the loss associated with these gaps is about 17 percent of income per capita. One-third of this loss is due to distortions in the choice of occupations between men and women. The remaining two-thirds corresponds to the costs associated with gaps in labor force participation. The dimensions of these gender gaps and their associated costs vary considerably across ages groups, with the age bracket 36–50 years being responsible for most of the losses.

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1   Introduction

There is a vast literature documenting the presence of gender gaps in the labor market in both developing and developed countries. Women are often underrepresented in the labor force in general but especially in high-earnings occupations. [1] In this paper we provide some descriptive statistics on the degree of gender inequality in participation the labor market and then use the framework in Cuberes and Teignier (2016) together with survey data to calculate the impact of these gender gaps on income and productivity in several countries of the Balkan Peninsula (Albania, Bosnia-Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, and Serbia) and Turkey. We carry out these calculations for our entire sample and also for specific age groups. The aforementioned countries represent an interesting group to study gender inequality in the labor market because they all belong in the category of middle-income countries and yet they have sizable labor gender gaps. Turkey, for instance, had a labor force gender gap of about 59% in 2007, i.e. out of every 100 men that participated in the labor market, only 41 women did so. We calculate that, for this group of countries, the average gender gap in labor force participation is around 41% in the latest available year, much higher than the one calculated in Cuberes and Teignier (2016) for the rest of European countries (around 16%).

To our knowledge, there are very few papers that quantify the macroeconomic effects of gender gaps in the labor market.[2] The International Labor Organization provides some estimates of the output costs associated with labor gender gaps in the Middle East and Northern Africa but without proposing any specific theoretical model (ILO, 2014). Another shortcoming of this exercise is that it does not allow one to shed light on the mechanisms through which gender gaps in the labor market may affect aggregate efficiency. Cavalcanti and Tavares (2016) construct a growth model based on Galor and Weil (1996) in which there is exogenous wage discrimination against women. Calibrating their model using U.S. data, they find very large effects associated with these wage gaps: a 50 percent increase in the gender wage gap in their model leads to a decrease in income per capita of a quarter of the original output. Their results also suggest that a large fraction of the actual difference in output per capita between the U.S. and other countries is indeed generated by the presence of gender inequality in wages. Hsieh et al. (2013) use a Roy model to estimate the effect of the changing occupational allocation of white women, black men, and black women between 1960 and 2008 on U.S. economic growth and find that the improved allocation of

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[1]See the World Development Report 2012 (World Bank, 2012) for a comprehensive review of these and other gender gaps.

[2]See Cuberes and Teignier (2015) for a critical literature review of the two-directional link between gender inequality and economic growth.

talent within the United States accounts for 17 to 20 percent of growth over this period. Finally, in the model summarized in Section 3.1 of this paper, Cuberes and Teignier (2016) calculate the macroeconomic effects of gender inequality in the labor market using data from the International Labor Organization for a large sample of countries, but they do not include any of the Balkan countries and they study the case of Turkey only in 2010.

The rest of the paper is organized as follows. Section 2 documents several gender gaps in the labor market of the eight countries considered here. In Section 3 we sketch the general equilibrium occupational choice model proposed by Cuberes and Teignier (2016) and calculate the static costs associated with the gaps in two different years, which vary across countries due to data availability. Section 4 carries out this exercise by different age groups and, finally Section 5 concludes the paper.

2 Gender Gaps in the Balkans and Turkey

Data Description

In this section we provide some descriptive statistics of the labor market in Albania, Bosnia-Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, Serbia, and Turkey for two recent years[3]. Table 1 lists the countries and years used in the paper, along with the number of available observations and their data sources.[4] The data come from household surveys and we only consider individuals at working age i.e. between the ages of 15 and 65.[5]

Figures 1 and 2 and tables 2-4 display the evolution of the gender gaps in labor force participation rates, self-employed, and employers for each country over the two years of available data. In terms of *Labor Force Participation,* the most salient feature is that there is a very large gender gap in labor force participation, with women being underrepresented in the labor market in all countries. This gap is largest in Kosovo, where only 31 women participate in the labor market for every 100 men that do so in 2012. Second, this gap increases

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[3]We choose two years that are four to six years apart to have some sense of how thse gaps have changed over time. We acknowledge the fact that this time interval overlaps in some cases with the so-called Great Recession that started in 2007 and that these may somewhat distort our calculations.

[4]All the variables used in the analysis contain data for the two years specified in this table. The only exception is Montenegro, for which we do not have information on self-employment for the year 2011. LFS stands for "Labor force survey" and ECAPOV stands for World Bank Database of household survey for Eastern Europe and Central Asia.

[5]In some cases we also consider the population above 65 years-old, although they represent a very small fraction of the observations.

Table 1: Data availability and sources

	t=1	obs	t=2	obs	source
Albania	2008	5044	2012	6083	ECAPOV
Bosnia and Herzegovina	-	-	2013	19203	LFS
Croatia	2004	6076	2009	6224	LFS
Kosovo	-	-	2012	587025	ECAPOV
Macedonia	2007	43187	2011	38078	ECAPOV
Montenegro	2007	2184	2011	2142	ECAPOV
Serbia	2006	10038	2010	8614	ECAPOV
Turkey	2007	21308	2013	25524	ECAPOV

in all countries over time, with the exception of Turkey, where it dramatically dropped by ten percentage points, from 59% to 49%.

In *Self-employment* (Table 3), the gap is also apparent in all countries, with the exception of Croatia, where men are underrepresented in both 2004 and 2009. The self-employment gap increases in Albania, Serbia, and Turkey and falls in Macedonia. The largest gap takes place in Macedonia in 2007, where only 28 women work as self-employed for every 100 men. Finally, there is a very clear gender gap in the category *Employers* (Table 4) where women are always underrepresented. Turkey has the largest gap in 2007, when only about 12 women worked as employers for every 100 men. The gap has decreased over time in Albania, Croatia, Macedonia, and Turkey; it has increased in Montenegro, and remained roughly constant in Serbia.

Table 2: Gender Gaps in Labor Force Participation (%)

	$t = 1$	$t = 2$
Albania	28.1	50.2
Bosnia and Herzegovina		38.4
Croatia	18.1	20.5
Kosovo		68.6
Macedonia	33.1	34.8
Montenegro	31.4	34.6
Serbia	31.3	31.8
Turkey	58.9	48.7

Figure 1: Gender gaps in Albania, Bosnia-Herzegovina, Croatia and Kosovo

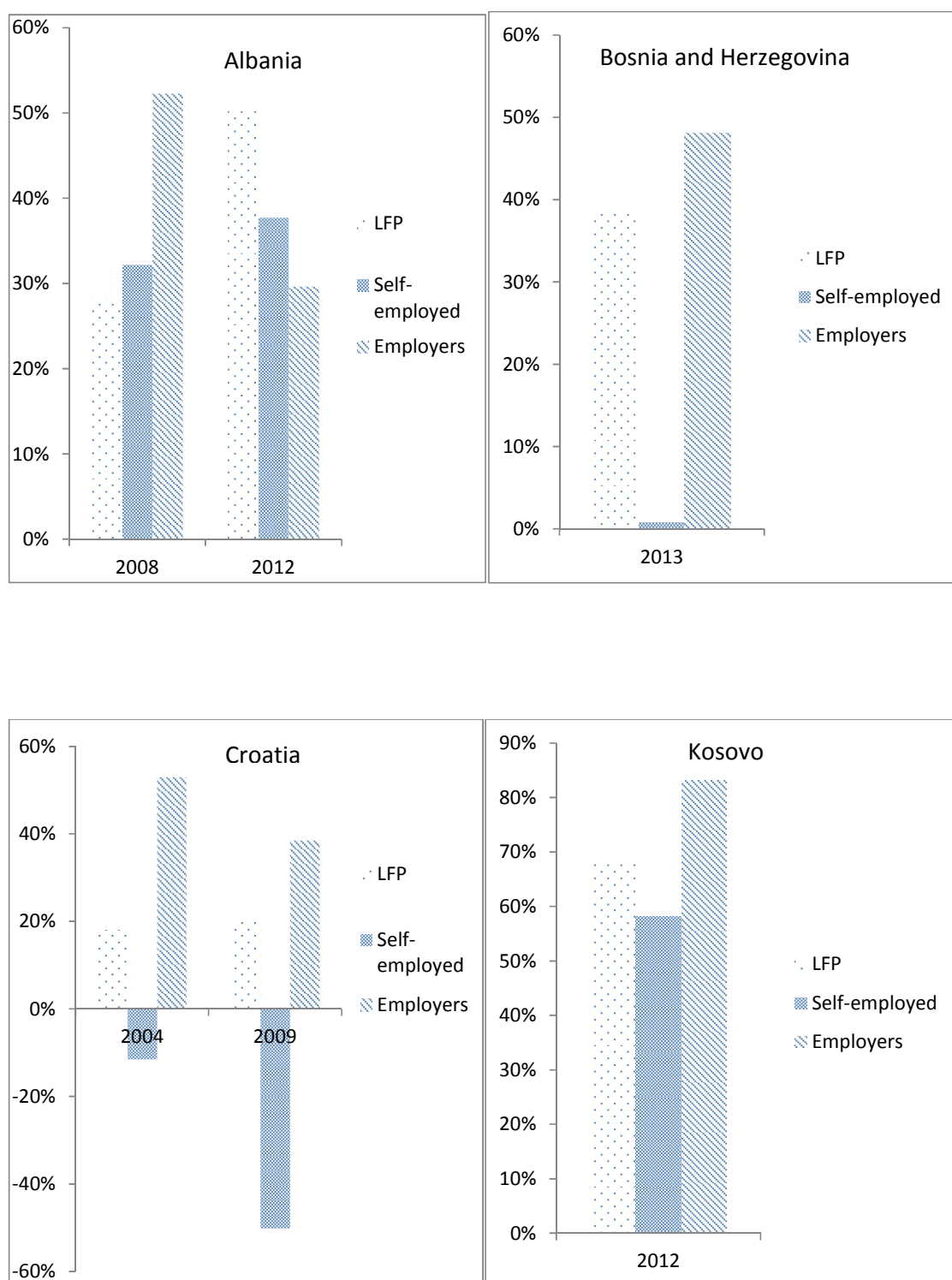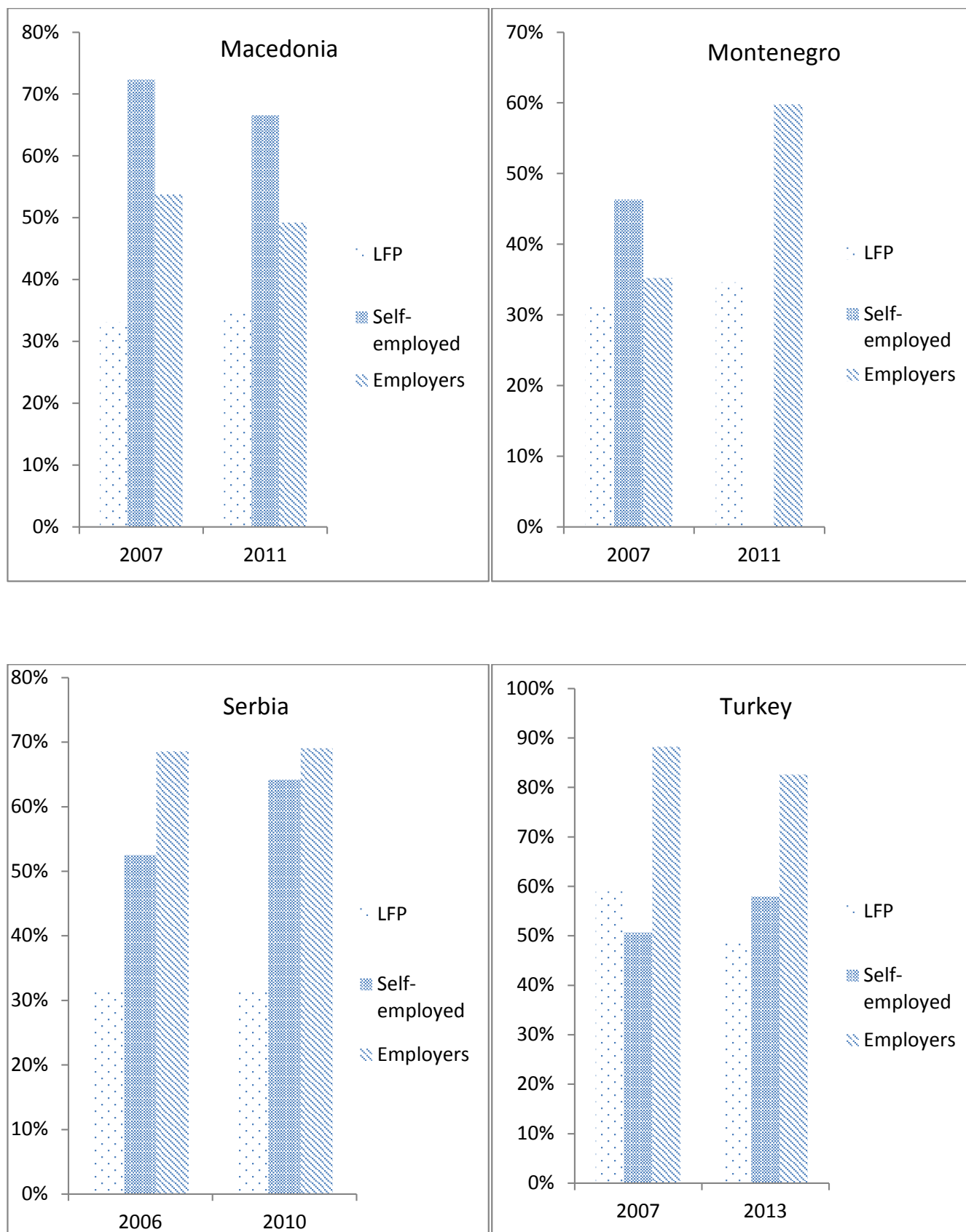**Figure 2:** Gender gaps in Macedonia, Montenegro, Serbia and Turkey

Table 3: Gender Gaps in Self-Employed (%)

	$t = 1$	$t = 2$
Albania	32.2	37.7
Bosnia and Herzegovina	-	0.7
Croatia	-11.5	-50.1
Kosovo	-	58.2
Macedonia	72.3	66.7
Montenegro	46.2	-
Serbia	52.5	64.2
Turkey	50.6	57.9

Table 4: Gender Gaps in Employers (%)

|	$t = 1$	$t = 2$
Albania	52.3	29.6
Bosnia and Herzegovina	-	48.1
Croatia	53	38.5
Kosovo	-	83.1
Macedonia	53.8	49.2
Montenegro	35.2	59.8
Serbia	68.6	69
Turkey	88.2	82.6

3 Aggregate effects of the gender gaps in the Balkans and Turkey

3.1 Theoretical benchmark

In order to help interpret the numerical results of Section 4, we present here a brief summary of the model developed in Cuberes and Teignier (2016). Their paper develops a general equilibrium occupational choice model where agents are endowed with a random entrepreneurship skill, based on which they decide to work as either employers, self-employed, or workers. An employer in this model can produce goods using a span-of-control technology that combines his or her entrepreneurship skills, capital, and workers. This span-of-control element implies that more talented agents run larger firms, as in Lucas (1978). On the other hand, a self-employed agent can produce goods using a similar technology - adjusted by a productivity parameter - but without hiring any workers. Figure 3 displays the payoff of the three occupations at each talent level and shows that in this model agents with the highest entrepreneurship skill (those with a talent equal or larger than z_2) optimally choose to become employers, whereas those with the least skill become workers (with a talent lower than z_1), leaving the self-employed occupation to agents with intermediate skill

levels.

Figure 3: The occupational map
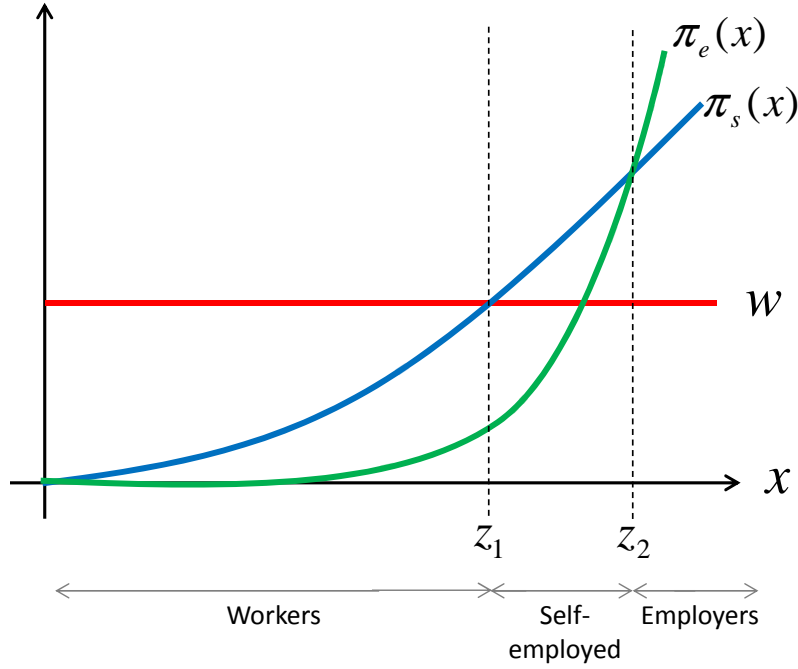
The model assumes that men and women are identical in terms of their managerial skills.[6] However, women are subject to several exogenous constraints in the labor market. The first two are that a fraction of women who would like to be employers or self-employed are excluded from these occupations. On top of that, those women who end up becoming workers may receive a lower wage than men. Finally, the model also assumes that a fraction of women are entirely excluded from participating in the labor market. The first three restrictions alter the occupational choice and have general equilibrium implications that allow us to calculate the corresponding fall in income per capita. On the other hand, the restriction on the percentage of women who can participate in the labor market results in a reduction in output per capita.[7]

The intuition behind the output loss is as follows. Assume a woman with very good management skills happens to be banned from becoming an employer. The model then implies that a less skilled man will take her position and become the manager of a firm. But note that, if this man has a lower managerial skill than the woman who is not allowed to become a manager, he will run a smaller firm - due to the nature of the span-of-control

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[6]This may not be the case if, for example, gender gaps in education generate differences in managerial skills. We abstract from this possibility because we don't have accurate data that allow us to map gaps in education with differences in managerial skills.

[7]We implicitly assume that women would have the same participation rate as men if there were allowed to work.

technology. This would then have general equilibrium implications in terms of the amount of output produced, wages and firms' profits. In particular, it is easy to show that output/income per worker would be lower in this economy as a result of this restriction (See Cuberes and Teignier (2016) for more details on this.). We measure this loss by taking the ratio between output or income per worker in a country with no gender gaps and the corresponding output or income per worker given the gender gaps that we observe in the data for that country.

3.2 Numerical results

Table 5 displays the estimated gender gaps and the corresponding income losses (with respect to a counterfactual scenario without gender gaps) for each of the countries in our sample. The third column shows the fraction of females who are excluded from the labor force, while columns 4 and 5 show the fraction of women excluded from employership and self-employment respectively. Column 6 shows the estimated loss in income per capita due to the three frictions, while in column 7 we can see the income loss due to the gender frictions in employership and self-employment. The difference between these last two columns - not displayed here - would correspond to the income loss generated by the gaps in the labor force participation.[8]

As we can see in the table, Kosovo in 2012 has the highest income loss, 28.2%, followed by Turkey with a loss of 25.3% in 2007 and 22% in 2013. Croatia is the country with the smallest income loss in both years. In column 7 we can see that Kosovo and Turkey are also the countries displaying the highest income loss due to gender frictions in entrepreneurship.[9] Figure 4 plots the last two columns of table 5 for the first and the last available years.

4 Costs of gender gaps by age group

The purpose of this section is to to decompose the total income loss into the different age group gaps. As argued in World Bank (2014), gender gaps are likely to vary across age groups and this may have important implications for the future evolution of the labor mar-

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[8]Our paper focuses on gender gaps in entrepreneurship and labor force participation. We don't have very good data on gender wage gaps and therefore we only calibrate the implied wage gap suggested by our model, without using actual data on this gap. In particular, whenever our model predicts too few self-employed women relative to the data, we impose a wage gap between men and women that pushes women towards becoming self-employed rather than workers. As it turns out, however, we only need to impose this wage gap in Croatia in 2009, and the gap is less than 3%.

[9]In our exercise we assume that countries do not have wage gaps unless we need to introduce them to match the observed fraction of female self-employed. For the set of countries studied here, only Croatia in 2009 requires the introduction of a wage gap, which is equal to about 2.5% of the wage rate that year.

Table 5: Income loss due to gender gaps, by country

	Year	LFP friction (%)	Employer's friction (%)	Self-employed's friction (%)	Total income loss from Gender Gaps (%)	Income loss due to Entrepr. Gap (%)
Albania	2008	28.14	52.29	33.83	13.24	4.3
	2012	50.16	29.64	38.73	19.87	2.95
Bosnia and Herzegovina	2013	38.36	48.1	13.93	16.41	4
Croatia	2004	18.14	52.95	21.78	10.1	4.41
	2009	20.52	38.47	0	9.74	3.01
Kosovo	2012	68.6	83.07	75.19	28.21	8.67
Macedonia	2007	33.11	53.76	77.14	15.53	5.29
	2011	34.84	49.22	71.73	15.75	4.78
Montenegro	2007	31.38	35.23	49.35	13.54	3.21
	2011	34.62	59.81	-	-	-
Serbia	2006	31.29	68.56	58.95	15.81	6.56
	2010	31.84	69.04	68.38	16.2	6.89
Turkey	2007	58.94	88.22	60.15	25.26	8.7
	2013	48.7	82.56	66.13	22.03	8.29

ket and, in particular, the distortions associated with these gaps. Table 6 displays the number of observations by country and age group.[10]

Table 6: Number of observations by age group

	Age 15-24		Age 25-35		Age 36-50		Age 51-65	
	$t = 1$	$t = 2$	$t = 1$	$t = 2$	$t = 1$	$t = 2$	$t = 1$	$t = 2$
Albania	660	492	982	1354	2167	2393	1137	1768
Bosnia and Herzegovina	-	3830	-	3645	-	5996	-	5616
Croatia	590	604	1508	1472	2712	2648	1286	1522
Kosovo	-	169393	-	146731	-	171452	-	99449
Macedonia	10150	8350	9096	7259	13523	11596	11060	11398
Montenegro	196	130	616	484	900	980	480	556
Serbia	734	442	2426	2022	4228	3704	2694	2472
Turkey	3816	2621	-	7681	7882	7974	3342	4475

4.1 Data description

Tables 7-9 report the existing gender gaps in the labor force participation, employers and self-employed for different age groups. We split our sample in four age groups: 15-24, 25-35, 36-50, and 51-65. Table 7 shows that there exist significant gender gaps against women in labor force participation in the majority of age groups. Interestingly, the largest gaps

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[10]For a study of the changing demographic profile of women in Turkey, see also Dayıoğlu and Kırdar (2010).

concentrate in the youngest population (ages 15-24) and the oldest one (ages 51-65). In the 15-24 group the largest gap takes place in Albania in 2012 (65.6%). In the 25-35, 36-50, and 51-65 age groups Kosovo has the largest gaps in 2012 (64.9%, 68.5%, and 80.4% respectively).

Table 7: Gender Gaps in Labor Force Participation by Age (%)

	Age 15-24		Age 25-35		Age 36-50		Age 51-65	
	$t=1$	$t=2$	$t=1$	$t=2$	$t=1$	$t=2$	$t=1$	$t=2$
Albania	39	65.6	7.1	46.3	22.7	37.9	45.7	62.5
Bosnia and Herzegovina	-	51.4	-	33.7	-	36.3	-	43.2
Croatia	15.6	44.3	20	23.5	11.7	1.8	29.4	34.9
Kosovo	-	61.7	-	64.9	-	68.5	-	80.4
Macedonia	41.2	44.3	23.3	27.4	26.7	27.2	49.9	47.3
Montenegro	18.5	19.4	29.8	22.1	31.5	32.8	37.8	49.7
Serbia	47.1	64.4	29.4	26.3	19.6	24.6	44.3	39.1
Turkey	35.8	46.2	59.8	22.9	66.1	57	62.2	60.6

In Table 8 it is again apparent that there are gender gaps in self-employment in almost all age groups. For this occupation, Macedonia leads the gaps in all cases, except in the age group 25-35, where Montenegro has the largest gap in 2007. On average, the age group with the largest gap is in the age bracket 51-65.

Table 8: Gender Gaps in Self-Employed by Age

	Age 15-24		Age 25-35		Age 36-50		Age 51-65	
	$t=1$	$t=2$	$t=1$	$t=2$	$t=1$	$t=2$	$t=1$	$t=2$
Albania	23.7	41.9	19.3	49	25.5	33	44.8	37.3
Bosnia and Herzegovina	-	45.5	-	12.2	-	0.9	-	-0.27
Croatia	49.2	-7.8	-7.2	9.5	-16.5	-44.6	-24	-77.8
Kosovo	-	75.7	-	58.1	-	59.9	-	29.5
Macedonia	68	84.5	69.5	61.5	72.4	63.3	74.3	71.9
Montenegro	69.3	-	79.6	-	55.1	-	-11.4	-
Serbia	71.6	79.9	52.3	67.2	56.8	55.8	43.1	67.9
Turkey	78.9	59.9	16.8	63.5	41.3	42.7	60.1	62.1

The gender gaps for employers by age are shown in Table 9. As before, most countries, years and age groups show women being underrepresented in this occupation, especially in ages between 15 and 24. In several instances the gaps are 100%, indicating that in our sample there are no female employers at all in these cases. Turkey shows the largest gaps in most groups and years.[11]

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[11]For Serbia we report an extremely high negative gender gap of -462%. This is due to the fact that there are very few observations for this country-year: only four females and two males report to be employers in that year.

Table 9: Gender Gaps in Employers by Age

	Age 15-24		Age 25-35		Age 36-50		Age 51-65	
	$t=1$	$t=2$	$t=1$	$t=2$	$t=1$	$t=2$	$t=1$	$t=2$
Albania	100	100	-43.5	55.6	75.4	11.2	26.3	27.2
Bosnia and Herzegovina	-	15.5	-	56	-	44	-	70.7
Croatia	-18.5	100	37.5	7.4	60.5	54.6	50	26.7
Kosovo	-	100	-	82.6	-	80.4	-	78.9
Macedonia	59.2	48.7	56.8	44.6	54.1	50.2	49.5	52.8
Montenegro	-	100	64.4	72.5	45.3	51.2	-7.2	53.8
Serbia	100	-462	37	74.6	70	76.6	80.5	64
Turkey	100	62.8	87.5	87.9	85.8	78	86.6	84.8

4.2 Methodology: aggregate costs by age group

To carry out the age group decomposition of the total income loss, we first need to calculate a counterfactual set of gender gaps for each age group. In particular, to get the fraction of the total income loss due to a particular age group, we compute what would the aggregate gender gap be if all the gender gaps were zero except for that particular age group.

For example, if we had two age groups, the aggregate employer's gap, denoted by μ, would be defined as follows:

$$\mu \equiv \frac{E_f^{all}/L_f^{all}}{E_m^{all}/L_m^{all}} = \frac{\frac{E_f^1+E_f^2}{L_f^1+L_f^2}}{\frac{E_m^1+E_m^2}{L_m^1+L_m^2}},$$

where E stands for number of employers and L represents the labor force. The subindexes f, m denote females and males, respectively, while the superindexes $1, 2$ represent the first and second age groups, respectively. Finally, the superindex all is the sum of the two groups. We can then rewrite μ in terms of the employers' gap of each group:

$$\mu = \frac{\mu_1 \frac{E_m^1}{L_m^1}\frac{L_f^1}{L_f^{all}} + \mu_2 \frac{E_m^2}{L_m^2}\frac{L_f^2}{L_f^{all}}}{E_m^{all}/L_m^{all}} \qquad (1)$$

where $\mu_i = \frac{E_f^i/L_f^i}{E_m^i/L_m^i}$, $i = 1, 2$. To compute the income loss due to the age group 1, for instance, we would set $\mu_2 = 1$ in equation (1), while to compute the income loss due to age group 2, we would set $\mu_1 = 1$.

For n groups we would have:

$$\mu = \frac{\sum_{j=1}^{n} \mu_j \frac{E_m^j}{L_m^j}\frac{L_f^j}{L_f^{all}}}{E_m^{all}/L_m^{all}} \qquad (2)$$

Table 10: Income loss decomposition by age group (as a fraction of the country's total income loss)

	Age 15-24		Age 25-35		Age 36-50		Age 51-65	
	$t=1$	$t=2$	$t=1$	$t=2$	$t=1$	$t=2$	$t=1$	$t=2$
Albania	16.05	11.35	3.86	22.77	49.37	27.69	35.24	37.93
Bosnia and Herzegovina	-	12.89	-	19.62	-	52.6	-	15.95
Croatia	5.26	17.88	21.11	20.39	44.49	24.82	28.79	35.33
Kosovo	-	15.63	-	29.02	-	39.75	-	21.06
Macedonia	13.87	11.76	19.35	17.74	37.56	35.35	29.75	35.17
Montenegro	5.45	-	30.83	-	46.16	-	23.43	-
Serbia	8.94	9.01	17.94	17.3	34.87	38.7	38.57	35.07
Turkey	10.9	13.89	32.17	18.63	46.79	49.56	21.76	21.75

4.3 Numerical results

Table 10 shows the fraction of the total income loss due to gender gaps of each age group. In the first row, for instance, we can see the decomposition of the total income loss in Albania for the latest available year: 11% of it is due to gender gaps in the age group 15-24, 23% is due to gender gaps in the age group 25-35, 28% is caused by gender gaps in the age group 36-50 and 38% to gender gaps in the age group 51-65. For most countries and years, the largest fraction of the total income loss comes from the third and fourth age groups, that is from individuals above age 35. The largest average loss is about 41%, which corresponds to the age group between 36 and 50 years-old, followed by a 29% average loss in the age group 51-65, a 21% average loss in the age group 25-35 and a 12% average loss in the age group 15-24.

Figure 5 plots for each country the income loss generated by each of the four age groups in the first and latest available year. The total height is the total income loss due to gender gaps and, as we can also see in Figure 4, Turkey has the largest losses in the first year while Kosovo displays the largest loss in the second year. In the first year, the area for age group 4 is the largest one in Serbia, while the area of age group 3 is the largest one for the rest of countries. In the last year, group 4 represents the largest area in Albania and Croatia, while group 3 is the largest for the rest of the countries.

5 Concluding remarks

In this paper we calculate gender gaps in labor force participation, employers and self-employed for several Balkan countries (Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Montenegro, and Serbia) and Turkey. Our survey data reveal very large gaps

in most countries in the two years studied, which reflect a puzzling underrepresentation of women in these countries given their relatively high income per capita. We then proceed to provide an estimate of the aggregate losses in terms of income per capita associated with this degree of gender inequality using the occupational choice model proposed in Cuberes and Teignier (2016).

Our results suggest sizable income per capita losses. On average, about 17% of income per capita is lost due to the gender gaps studied here. Of this loss, about a third can be attributed to the low numbers of women working as employers and/or self-employed. For comparison purposes, Cuberes and Teignier (2016), using ILO data, obtain an average income loss of 10.5% in Europe, while only Middle East and North Africa, as well as South Asia, have larger average income losses. When we conduct our analysis for different age groups, we find that the small role played in the labor market by women between the ages of 36 and 50 explains the largest fraction of the income losses due to gender gaps in the labor market.

As stated above, in our calculations we assume that men and women have the same distribution of managerial skills. Moreover, we assume that there are no restrictions in the capital market and so capital is assigned to firms in a competitive way. If women had lower skills than men, and/or had less access to capital than men we may be overestimating the effects of the entrepreneurship gender gaps. On the other hand, we may be underestimating them if, for example, gender gaps are larger in sectors with larger span-of-control parameters, i.e., sectors in which managerial ability is more important for production. Quantifying the importance of these biases is left for future research.

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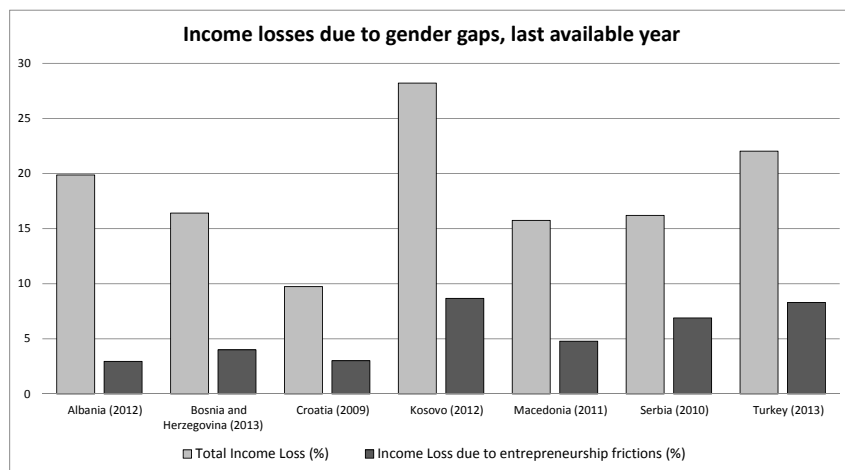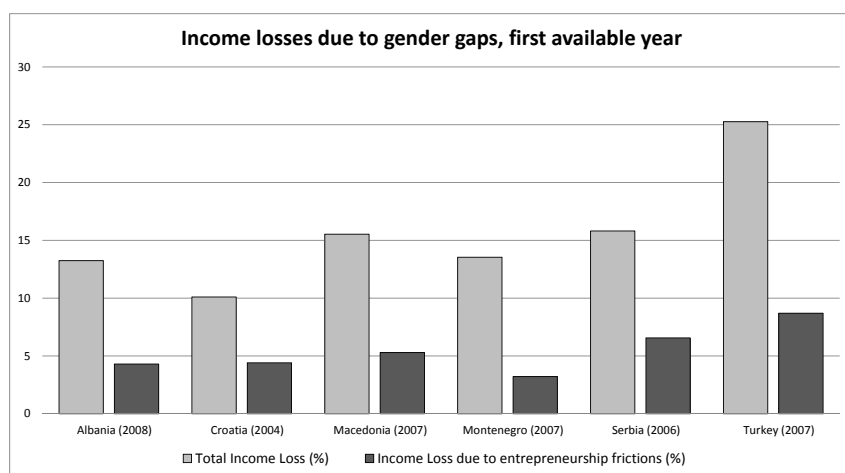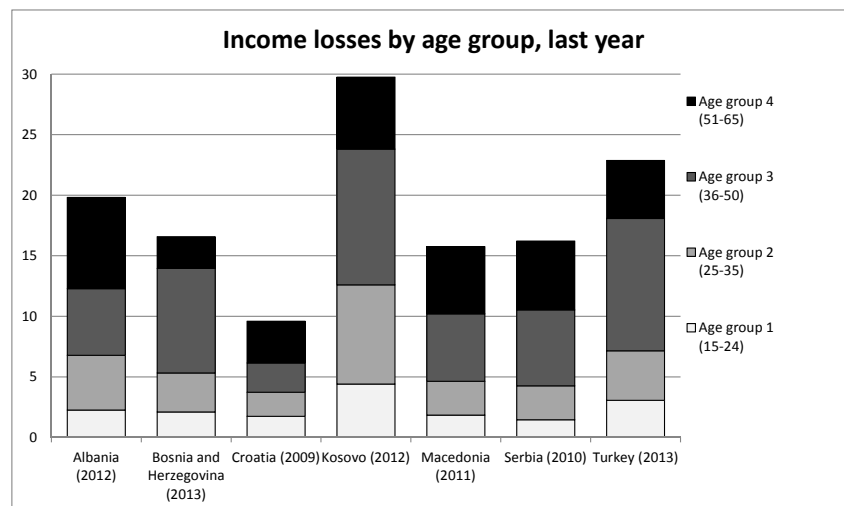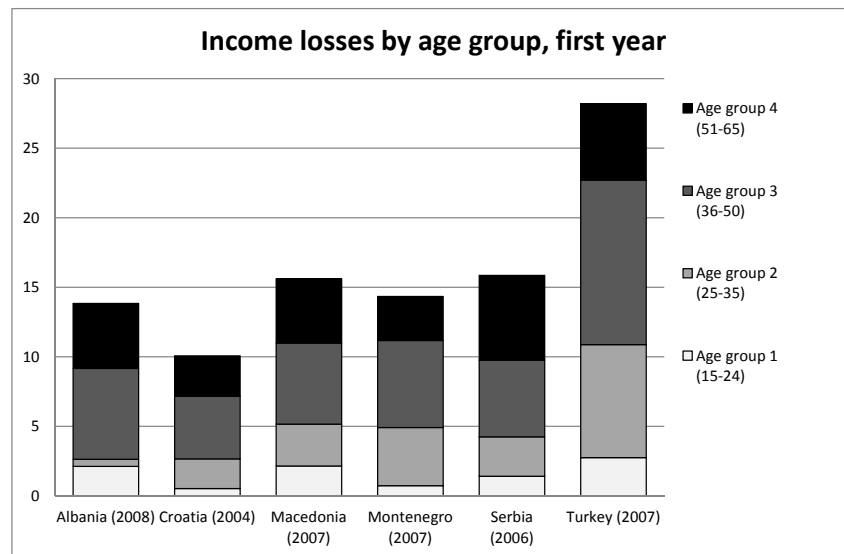**Figure 4:** Income and productivity losses due to gender gaps, by country

Income losses due to gender gaps, first available year

Income losses due to gender gaps, last available year

Figure 5: Income losses due to gender gaps, by age group

Income losses by age group, first year

Age group 4 (51-65)
Age group 3 (36-50)
Age group 2 (25-35)
Age group 1 (15-24)

Albania (2008) Croatia (2004) Macedonia (2007) Montenegro (2007) Serbia (2006) Turkey (2007)

Income losses by age group, last year

Age group 4 (51-65)
Age group 3 (36-50)
Age group 2 (25-35)
Age group 1 (15-24)

Albania (2012) Bosnia and Herzegovina (2013) Croatia (2009) Kosovo (2012) Macedonia (2011) Serbia (2010) Turkey (2013)

2006

CREAP2006-01
Matas, A. (GEAP)**; Raymond, J.Ll.** (GEAP)
"Economic development and changes in car ownership patterns"
(Juny 2006)

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Trillas, F. (IEB)**; Montolio, D.** (IEB)**; Duch, N.** (IEB)
"Productive efficiency and regulatory reform: The case of Vehicle Inspection Services"
(Setembre 2006)

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Bel, G. (PPRE-IREA)**; Fageda, X.** (PPRE-IREA)
"Factors explaining local privatization: A meta-regression analysis"
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Fernàndez-Villadangos, L. (PPRE-IREA)
"Are two-part tariffs efficient when consumers plan ahead?: An empirical study"
(Octubre 2006)

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Artís, M. (AQR-IREA)**; Ramos, R.** (AQR-IREA)**; Suriñach, J.** (AQR-IREA)
"Job losses, outsourcing and relocation: Empirical evidence using microdata"
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Alcañiz, M. (RISC-IREA)**; Costa, A.; Guillén, M.** (RISC-IREA)**; Luna, C.; Rovira, C.**
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What has happened in recent years?"
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Royuela, V. (AQR-IREA)**; Lambiri, D.**; **Biagi**, **B.**
"Economía urbana y calidad de vida. Una revisión del estado del conocimiento en España"
(Desembre 2006)

CREAP2006-14

Camarero, M.; Carrion-i-Silvestre, J.LL. (AQR-IREA).;**Tamarit**, **C.**
"New evidence of the real interest rate parity for OECD countries using panel unit root tests with breaks"
(Desembre 2006)

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Karanassou, M.; Sala, H. (GEAP).;**Snower** , **D. J.**
"The macroeconomics of the labor market: Three fundamental views"
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2007

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Castany, L (AQR-IREA)**; López-Bazo, E.** (AQR-IREA).;**Moreno** , **R.** (AQR-IREA)
"Decomposing differences in total factor productivity across firm size"
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Raymond, J. Ll. (GEAP)**; Roig, J. Ll.** (GEAP)
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"An empirical analysis of wealth taxation: Equity vs. Tax compliance"
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Matas, A. (GEAP)**; Raymond, J.Ll.** (GEAP)
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"Tax differentials and agglomeration economies in intraregional firm location"
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"Evaluating the impact of public subsidies on a firm's performance: a quasi-experimental approach"
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"Innovation sources and productivity: a quantile regression analysis"
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"Shifting death to their Alternatives: The case of Toll Motorways"
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Segarra-Blasco, A. (GRIT); **Garcia-Quevedo, J.** (IEB); **Teruel-Carrizosa, M.** (GRIT)
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"Comparison of recent toll road concession transactions in the United States and France"
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Bermúdez Morata, Ll. (RFA-IREA); **Guillén Estany, M.** (RFA-IREA), **Solé Auró, A**. (RFA-IREA)
"Impacto de la inmigración sobre la esperanza de vida en salud y en discapacidad de la población española"
 (Novembre 2007)

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Calaeys, P. (AQR-IREA); **Ramos, R.** (AQR-IREA), **Suriñach, J**. (AQR-IREA)
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Borrell, J. R. (PPRE-IREA)**; Fernández-Villadangos, L.** (PPRE-IREA)
"Assessing excess profits from different entry regulations"
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Sanromá, E. (IEB)**; Ramos, R.** (AQR-IREA), **Simon, H.**
"Los salarios de los inmigrantes en el mercado de trabajo español. ¿Importa el origen del capital humano?"
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"(No)competition in the Spanish retailing gasoline market: a variance filter approach"
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"Competition between TV Platforms"
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"The determinants of university patenting: Do incentives matter?"
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Ramos, R. (AQR-IREA), **Suriñach, J.** (AQR-IREA)**, Artís, M.** (AQR-IREA)
"Human capital spillovers, productivity and regional convergence in Spain"
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Álvarez-Albelo, C. D. (CREB), **Hernández-Martín, R.**
"The commons and anti-commons problems in the tourism economy"
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García-López, M. A. (GEAP)
"The Accessibility City. When Transport Infrastructure Matters in Urban Spatial Structure"
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García-Quevedo, J. (IEB), **Mas-Verdú, F.** (IEB), **Polo-Otero, J.** (IEB)
"Which firms want PhDs? The effect of the university-industry relationship on the PhD labour market"
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"An introduction to parametric and non-parametric models for bivariate positive insurance claim severity distributions"
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"Modelling dependence in a ratemaking procedure with multivariate Poisson regression models"
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Di Paolo, A. (IEB)
"Parental education and family characteristics: educational opportunities across cohorts in Italy and Spain"
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Simón, H. (IEB), **Ramos, R.** (AQR-IREA), **Sanromá, E.** (IEB)

"Movilidad ocupacional de los inmigrantes en una economía de bajas cualificaciones. El caso de España"
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Di Paolo, A. (GEAP & IEB), **Raymond, J. Ll.** (GEAP & IEB)
"Language knowledge and earnings in Catalonia"
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Bolancé, C. (RFA-IREA), **Alemany, R.** (RFA-IREA), **Guillén, M.** (RFA-IREA)
"Prediction of the economic cost of individual long-term care in the Spanish population"
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Di Paolo, A. (GEAP & IEB)
"Knowledge of catalan, public/private sector choice and earnings: Evidence from a double sample selection model"
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Coad, A., **Segarra, A.** (GRIT), **Teruel, M.** (GRIT)
"Like milk or wine: Does firm performance improve with age?"
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Di Paolo, A. (GEAP & IEB), **Raymond, J. Ll.** (GEAP & IEB), **Calero, J.** (IEB)
"Exploring educational mobility in Europe"
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Borrell, A. (GiM-IREA), **Fernández-Villadangos, L.** (GiM-IREA)
"Clustering or scattering: the underlying reason for regulating distance among retail outlets"
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Di Paolo, A. (GEAP & IEB)
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Fageda, X. (GiM-IREA), **Flores-Fillol, R.**
"Technology, Business Models and Network Structure in the Airline Industry"
(Desembre 2010)

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Albalate, D. (GiM-IREA), **Bel, G.** (GiM-IREA), **Fageda, X.** (GiM-IREA)
"Is it Redistribution or Centralization? On the Determinants of Government Investment in Infrastructure"
(Desembre 2010)

XREAP2010-16
Oppedisano, V., **Turati, G.**
"What are the causes of educational inequalities and of their evolution over time in Europe? Evidence from PISA"
(Desembre 2010)

XREAP2010-17
Canova, L., **Vaglio, A.**
"Why do educated mothers matter? A model of parental help"
(Desembre 2010)

2011

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Fageda, X. (GiM-IREA), **Perdiguero, J.** (GiM-IREA)
"An empirical analysis of a merger between a network and low-cost airlines"
(Maig 2011)

XREAP2011-02
Moreno-Torres, I. (ACCO, CRES & GiM-IREA)
"What if there was a stronger pharmaceutical price competition in Spain? When regulation has a similar effect to collusion"
(Maig 2011)

XREAP2011-03
Miguélez, E. (AQR-IREA); **Gómez-Miguélez, I.**
"Singling out individual inventors from patent data"
(Maig 2011)

XREAP2011-04
Moreno-Torres, I. (ACCO, CRES & GiM-IREA)
"Generic drugs in Spain: price competition vs. moral hazard"
(Maig 2011)

XREAP2011-05
Nieto, S. (AQR-IREA)**, Ramos, R.** (AQR-IREA)
"¿Afecta la sobreeducación de los padres al rendimiento académico de sus hijos?"
(Maig 2011)

XREAP2011-06
Pitt, D., **Guillén, M.** (RFA-IREA), **Bolancé, C.** (RFA-IREA)
"Estimation of Parametric and Nonparametric Models for Univariate Claim Severity Distributions - an approach using R"
(Juny 2011)

XREAP2011-07
Guillén, M. (RFA-IREA), **Comas-Herrera, A.**
"How much risk is mitigated by LTC Insurance? A case study of the public system in Spain"
(Juny 2011)

XREAP2011-08
Ayuso, M. (RFA-IREA), **Guillén, M.** (RFA-IREA), **Bolancé, C.** (RFA-IREA)
"Loss risk through fraud in car insurance"
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XREAP2011-09
Duch-Brown, N. (IEB), **García-Quevedo, J.** (IEB), **Montolio, D.** (IEB)
"The link between public support and private R&D effort: What is the optimal subsidy?"
(Juny 2011)

XREAP2011-10
Bermúdez, Ll. (RFA-IREA), **Karlis, D.**
"Mixture of bivariate Poisson regression models with an application to insurance"
(Juliol 2011)

XREAP2011-11
Varela-Irimia, X-L. (GRIT)
"Age effects, unobserved characteristics and hedonic price indexes: The Spanish car market in the 1990s"
(Agost 2011)

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Bermúdez, Ll. (RFA-IREA), **Ferri, A.** (RFA-IREA), **Guillén, M.** (RFA-IREA)
"A correlation sensitivity analysis of non-life underwriting risk in solvency capital requirement estimation"
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XREAP2011-13
Guillén, M. (RFA-IREA), **Pérez-Marín, A.** (RFA-IREA), **Alcañiz, M.** (RFA-IREA)
"A logistic regression approach to estimating customer profit loss due to lapses in insurance"
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XREAP2011-14
Jiménez, J. L., **Perdiguero, J.** (GiM-IREA), **García, C.**
"Evaluation of subsidies programs to sell green cars: Impact on prices, quantities and efficiency"
(Octubre 2011)

XREAP2011-15
Arespa, M. (CREB)
"A New Open Economy Macroeconomic Model with Endogenous Portfolio Diversification and Firms Entry"
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Matas, A. (GEAP), **Raymond, J. L.** (GEAP), **Roig, J.L.** (GEAP)
"The impact of agglomeration effects and accessibility on wages"
(Novembre 2011)

XREAP2011-17
Segarra, A. (GRIT)
"R&D cooperation between Spanish firms and scientific partners: what is the role of tertiary education?"
(Novembre 2011)

XREAP2011-18
García-Pérez, J. I.; **Hidalgo-Hidalgo, M.**; **Robles-Zurita, J. A.**
"Does grade retention affect achievement? Some evidence from PISA"
(Novembre 2011)

XREAP2011-19
Arespa, M. (CREB)
"Macroeconomics of extensive margins: a simple model"
(Novembre 2011)

XREAP2011-20
García-Quevedo, J. (IEB), **Pellegrino, G.** (IEB), **Vivarelli, M.**
"The determinants of YICs' R&D activity"
(Desembre 2011)

XREAP2011-21
González-Val, R. (IEB), **Olmo, J.**
"Growth in a Cross-Section of Cities: Location, Increasing Returns or Random Growth?"
(Desembre 2011)

XREAP2011-22
Gombau, V. (GRIT), **Segarra, A.** (GRIT)
"The Innovation and Imitation Dichotomy in Spanish firms: do absorptive capacity and the technological frontier matter?"
(Desembre 2011)

2012

XREAP2012-01
Borrell, J. R. (GiM-IREA), **Jiménez, J. L.**, **García, C.**
"Evaluating Antitrust Leniency Programs"
(Gener 2012)

XREAP2012-02
Ferri, A. (RFA-IREA), **Guillén, M.** (RFA-IREA), **Bermúdez, Ll.** (RFA-IREA)
"Solvency capital estimation and risk measures"
(Gener 2012)

XREAP2012-03
Ferri, A. (RFA-IREA), **Bermúdez, Ll.** (RFA-IREA), **Guillén, M.** (RFA-IREA)
"How to use the standard model with own data"
(Febrer 2012)

XREAP2012-04
Perdiguero, J. (GiM-IREA), **Borrell, J.R.** (GiM-IREA)
"Driving competition in local gasoline markets"
(Març 2012)

XREAP2012-05
D'Amico, G., **Guillen, M.** (RFA-IREA), Manca, R.
"Discrete time Non-homogeneous Semi-Markov Processes applied to Models for Disability Insurance"
(Març 2012)

XREAP2012-06
Bové-Sans, M. A. (GRIT), Laguado-Ramírez, R.
"Quantitative analysis of image factors in a cultural heritage tourist destination"
(Abril 2012)

XREAP2012-07
Tello, C. (AQR-IREA), **Ramos, R.** (AQR-IREA), **Artís, M.** (AQR-IREA)
"Changes in wage structure in Mexico going beyond the mean: An analysis of differences in distribution, 1987-2008"
(Maig 2012)

XREAP2012-08
Jofre-Monseny, J. (IEB), **Marín-López, R.** (IEB), **Viladecans-Marsal, E.** (IEB)
"What underlies localization and urbanization economies? Evidence from the location of new firms"
(Maig 2012)

XREAP2012-09
Muñiz, I. (GEAP), **Calatayud, D.**, **Dobaño, R.**
"Los límites de la compacidad urbana como instrumento a favor de la sostenibilidad. La hipótesis de la compensación en Barcelona medida a través de la huella ecológica de la movilidad y la vivienda"
(Maig 2012)

XREAP2012-10
Arqué-Castells, P. (GEAP), **Mohnen, P.**
"Sunk costs, extensive R&D subsidies and permanent inducement effects"
(Maig 2012)

XREAP2012-11
Boj, E. (CREB), **Delicado, P.**, **Fortiana, J**., **Esteve, A.**, **Caballé, A.**
"Local Distance-Based Generalized Linear Models using the dbstats package for R"
(Maig 2012)

XREAP2012-12
Royuela, V. (AQR-IREA)
"What about people in European Regional Science?"
(Maig 2012)

XREAP2012-13
Osorio A. M. (RFA-IREA)**, Bolancé, C.** (RFA-IREA), **Madise, N.**
"Intermediary and structural determinants of early childhood health in Colombia: exploring the role of communities"
(Juny 2012)

XREAP2012-14
Miguelez. E. (AQR-IREA)**, Moreno, R.** (AQR-IREA)
"Do labour mobility and networks foster geographical knowledge diffusion? The case of European regions"
(Juliol 2012)

XREAP2012-15
Teixidó-Figueras, J. (GRIT)**, Duró, J. A.** (GRIT)
"Ecological Footprint Inequality: A methodological review and some results"
(Setembre 2012)

XREAP2012-16
Varela-Irimia, X-L. (GRIT)
"Profitability, uncertainty and multi-product firm product proliferation: The Spanish car industry"
(Setembre 2012)

XREAP2012-17
Duró, J. A. (GRIT), **Teixidó-Figueras, J.** (GRIT)
"Ecological Footprint Inequality across countries: the role of environment intensity, income and interaction effects"
(Octubre 2012)

XREAP2012-18
Manresa, A. (CREB), **Sancho, F.**
"Leontief versus Ghosh: two faces of the same coin"
(Octubre 2012)

XREAP2012-19
Alemany, R. (RFA-IREA), **Bolancé, C.** (RFA-IREA), **Guillén, M.** (RFA-IREA)
"Nonparametric estimation of Value-at-Risk"
(Octubre 2012)

XREAP2012-20
Herrera-Idárraga, P. (AQR-IREA), **López-Bazo, E.** (AQR-IREA), **Motellón, E.** (AQR-IREA)
"Informality and overeducation in the labor market of a developing country"
(Novembre 2012)

XREAP2012-21
Di Paolo, A. (AQR-IREA)
"(Endogenous) occupational choices and job satisfaction among recent PhD recipients: evidence from Catalonia"
(Desembre 2012)

2013

XREAP2013-01
Segarra, A. (GRIT), **García-Quevedo, J.** (IEB), **Teruel, M.** (GRIT)
"Financial constraints and the failure of innovation projects"
(Març 2013)

XREAP2013-02
Osorio, A. M. (RFA-IREA), **Bolancé, C.** (RFA-IREA), Madise, N., Rathmann, K.
"Social Determinants of Child Health in Colombia: Can Community Education Moderate the Effect of Family Characteristics?"
(Març 2013)

XREAP2013-03
Teixidó-Figueras, J. (GRIT), **Duró, J. A.** (GRIT)
"The building blocks of international ecological footprint inequality: a regression-based decomposition"
(Abril 2013)

XREAP2013-04
Salcedo-Sanz, S., **Carro-Calvo, L.**, **Claramunt, M.** (CREB), **Castañer, A.** (CREB), **Marmol, M.** (CREB)
"An Analysis of Black-box Optimization Problems in Reinsurance: Evolutionary-based Approaches"
(Maig 2013)

XREAP2013-05
Alcañiz, M. (RFA), **Guillén, M.** (RFA), **Sánchez-Moscona, D.** (RFA), **Santolino, M.** (RFA), **Llatje, O., Ramon, Ll.**
"Prevalence of alcohol-impaired drivers based on random breath tests in a roadside survey"
(Juliol 2013)

XREAP2013-06
Matas, A. (GEAP & IEB), **Raymond, J. Ll.** (GEAP & IEB), **Roig, J. L.** (GEAP)
"How market access shapes human capital investment in a peripheral country"
(Octubre 2013)

XREAP2013-07
Di Paolo, A. (AQR-IREA), **Tansel, A.**
"Returns to Foreign Language Skills in a Developing Country: The Case of Turkey"
(Novembre 2013)

XREAP2013-08
Fernández Gual, V. (GRIT), **Segarra, A.** (GRIT)
"The Impact of Cooperation on R&D, Innovation andProductivity: an Analysis of Spanish Manufacturing and Services Firms"
(Novembre 2013)

XREAP2013-09
Bahraoui, Z. (RFA); **Bolancé, C.** (RFA); **Pérez-Marín. A. M.** (RFA)
"Testing extreme value copulas to estimate the quantile"
(Novembre 2013)

2014

XREAP2014-01
Solé-Auró, A. (RFA), **Alcañiz, M.** (RFA)
"Are we living longer but less healthy? Trends in mortality and morbidity in Catalonia (Spain), 1994-2011"
(Gener 2014)

XREAP2014-02

Teixidó-Figueres, J. (GRIT), **Duro, J. A.** (GRIT)
"Spatial Polarization of the Ecological Footprint distribution"
(Febrer 2014)

XREAP2014-03
Cristobal-Cebolla, A.; Gil Lafuente, A. M. (RFA), **Merigó Lindhal, J. M.** (RFA)
"La importancia del control de los costes de la no-calidad en la empresa"
(Febrer 2014)

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Castañer, A. (CREB); **Claramunt, M.M.** (CREB)
"Optimal stop-loss reinsurance: a dependence analysis"
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Di Paolo, A. (AQR-IREA); **Matas, A.** (GEAP); **Raymond, J. Ll.** (GEAP)
"Job accessibility, employment and job-education mismatch in the metropolitan area of Barcelona"
(Maig 2014)

XREAP2014-06
Di Paolo, A. (AQR-IREA); **Mañé, F.**
"Are we wasting our talent? Overqualification and overskilling among PhD graduates"
(Juny 2014)

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Segarra, A. (GRIT); **Teruel, M.** (GRIT); **Bové, M. A.** (GRIT)
"A territorial approach to R&D subsidies: Empirical evidence for Catalonian firms"
(Setembre 2014)

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Ramos, R. (AQR-IREA); **Sanromá, E.** (IEB); **Simón, H.**
"Public-private sector wage differentials by type of contract: evidence from Spain"
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XREAP2014-09
Bel, G. (GiM-IREA); **Bolancé, C.** (Riskcenter-IREA); **Guillén, M.** (Riskcenter-IREA)**; Rosell, J.** (GiM-IREA)
"The environmental effects of changing speed limits: a quantile regression approach"
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2015

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Bolance, C. (Riskcenter-IREA); **Bahraoui, Z.** (Riskcenter-IREA), **Alemany, R.** (Risckcenter-IREA)
"Estimating extreme value cumulative distribution functions using bias-corrected kernel approaches"
(Gener 2015)

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Ramos, R. (AQR-IREA); **Sanromá, E.** (IEB), **Simón, H.**
"An analysis of wage differentials between full- and part-time workers in Spain"
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Cappellari, L.; **Di Paolo, A.** (AQR-IREA)
"Bilingual Schooling and Earnings: Evidence from a Language-in-Education Reform"
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Caminal, R., Di Paolo, A. (AQR-IREA)
Your language or mine?
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Choi, H. (AQR-IREA)**, Choi, A.** (IEB)
When one door closes: the impact of the hagwon curfew on the consumption of private tutoring in the Republic of Korea

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Castañer, A. (CREB, XREAP); **Claramunt, M M.** (CREB, XREAP), **Tadeo, A.**, **Varea, J.** (CREB, XREAP)
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Bernardo, V. (GiM-IREA, XREAP); **Fageda, X.** (GiM-IREA, XREAP)
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