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# Some Economic Consequences of Higher Education Expansion in Turkey \*

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## Abstract

This article discusses recent structural changes in Turkish higher education to draw attention to a number of social and economic consequences of this expansion in terms of mobility and inequality over the last ten years. First, we outline the institutional background of the expansion of higher education in order to identify various re-distributive dimensions of the policy. Compared to 2004, creating new universities and increasing the existing capacity almost doubled the college enrollment rates. Subsidies facilitating more education grants and fee waivers were followed by heavy investment in public student accommodation. This policy was initiated as a political move targeting regional development, taking on a redistributive character by reorienting public funds toward poorer eastern regions. In this paper, we limit our focus to the impacts of these policies on the local labor market. By using household labor force surveys between 2004 and 2014, firstly, we explored how college proximity had an effect on access to college for the local families. Our results from a difference-in-difference model provide evidence that this policy had an equity-enhancing effect for daughters of low-educated families in some regions with large-scale expansion. The results also indicate that the regional mobility of educated workers may be slowed by this expansion. Secondly, we investigated whether the compositional change has affected local returns to college degrees and relative convergence across regions. Estimation results show that despite the increase in college graduates, returns in terms of wages at the local level are increasing and that some regional convergence was attained. Finally, we discuss segmentation of Turkey's labor force in terms of education levels and its impact on earnings-age profiles by contrasting 2004 and 2014.

**Keywords:** I23, I26, R23

**JEL Classification:** Higher education, Returns to education, regional labor markets, College proximity, Turkey

## 1 Introduction

Institutions designing higher education have economic and social significance by determining and reproducing selection mechanisms which match ability and rewards in a society. We can

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define two channels through which public expenditure can increase access to higher education. In countries where higher education is dominated by the public sector, the main channel is the educational capacity decided by governments while the second is the lowered cost of attending and graduating from college that increases access. If tuitions are not substantial, public grants and accommodation facilities can help to sustain equality of opportunities (Curs et al., 2011). Otherwise, increased capacity can be equity impeding, meaning that only wealthier families can afford the cost. This longstanding debate was widely discussed in the early 1970s (Hansen and Weisbrod, 1969), particularly regarding the question is of whether allocating more resources and higher education subsidies are equity enhancing or equity impeding. More recent discussion has focused on the positive and negative selection of likely college attenders due to expansion. Choi (2015) studied the causal impact of expansion on college access using a counter-factual analysis to include compliers before and after expansion. Our study, however, focuses more on treatment at the regional level. Brand and Xie (2010) found a negative selection effect of expansion, which is less relevant for Turkey's case, where selection is more centralized and the gender dimension of the proximity effect favors the positive selection argument. We argue that besides a means-tested grant system, college proximity is one of the important factors reducing the cost of attending a college. These factors can be operational unless the bottleneck created for selection mechanism works according to equity and efficiency principles.

Explaining a country-specific selection mechanism requires understanding of the political and institutional background. For Turkey, the selection mechanism of the higher education system is itself an institution with roots in the pre-democratic era dating back to the foundation of the Republic. Secondly, Turkey's higher education institutions have a dynamic character necessary to keep up with the contemporary conditions of an emerging democratic society. The evolving need for institutional change in higher education is thus a political issue since, to a certain extent, any modification requires public consent regarding its economic and social consequences. Furthermore, there is the important issue of public finance for the burdensome costs of higher education, which has a re-distributive character. One recently emerging field of research deals with the political economy of higher education in terms of public finance.

To the degree that the expansion of higher education reaches a wider portion of society and hence has a more egalitarian character involving a more democratic contribution, it is likely

that the political landscape and competition will change in the long run. Iversen and Stephens (2008), however, notes that higher education seems less re-distributive than public investment in primary and secondary education. In this paper, we will draw attention to the social and economic changes that can be related to Turkey's expansion of post-secondary education. Our main argument is that, since 2006, newly emerging universities have expanded into relatively less developed regions, which has substantially changed the share of enrolled college students. We first discuss the institutional and historical background of higher education before providing some figures related to the magnitude of the expansion.

The following sections provide a brief economic and political account of recent developments around the latest expansion of higher education in Turkey. In the first section, we provide a short history of higher education institutions and the major changes that they underwent. We draw attention to changes in selection mechanisms, such as the central entrance exam introduced in 1974 and restrictions imposed by the National Security Council in 1996. We then discuss why investing in higher education is politically desirable in terms of capacity building and local development. We argue that the new universities founded during the rule of the Justice and Development Party (JDP)<sup>1</sup> have contributed to local development via a reprioritization of public investments and demand externalities through increased public grants and accommodation facilities targeting college students. In this sense, the expansion in 2006 offers beneficial local political windfalls as well as equality enhancing educational opportunities. It seems that this policy shift will have some long-term consequences that will affect Turkey's social and economic structure. We focus on two interesting outcomes, namely localization and convergence of poor regions in labor market returns to education. We find that local enrollment has increased for both boys and girls following the capacity increase in new universities. More specifically, for girls, we find that low-educated families have benefited more from college proximity. The final section discusses the impact of increased numbers of college graduates on relative returns to education. Regional estimates of wage regressions before and after the expansion show that there is a convergence in terms of marginal returns of graduating from college.

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<sup>1</sup>JDP is the translation of the Turkish name for Adalet ve Kalkinma Partisi (AKP)

## 2 Investing in Higher Education

During its relatively long tenure in government, JDP has shown its willingness to expand higher education and improve access in favor of its electorate<sup>2</sup>, but without paying much attention to the lagging changes in institutional structure.<sup>3</sup> Investing in post-secondary education and opening new universities yields development and economic rents besides political and social ones. Firstly, the institutional framework of budgetary expenditure encourages central governments to pursue large scale public investment at the local level. Turkey remains one of the few OECD countries where public finance is mostly centralized (Blöchliger and Rabesona, 2009). Large-scale expenditure is financed through central government grants and executed via governors (local appointees of central government) while Turkey's local governance system gives only very limited appropriations to mayors, who are the only elected local authority in each province. In this respect, the local spending-revenue balance depends mostly on political maneuvering in order to address locals' demands for easier access to higher education. This political intermediation gives more weight to pork-barrel/patronage politics, which in turn makes central government a key actor for the provision of public goods at the local level. Özcan (2006) discusses the issue of large-scale local spending around three development projects<sup>4</sup> initiated with the approval of central government that failed due to the inability of local political groups and the central authority to coordinate.

### 2.1 Political and Institutional Background

Besides serving to secure higher social status, tertiary education in Turkey has also been valued as a means of upward mobility in income and lifestyle. Low average education levels and limited access to higher education justify social aspirations related to the importance of being educated. Table 1 illustrates the relationship between intergenerational educational mobility and income as of 2007. The educational divide between income quantiles, implying higher returns for better-educated people, are not unexpected. What is surprising, however, is the importance of the father's education level, indicating that social inheritance fundamentally

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<sup>2</sup>Başlevent et al. (2005) finds that JDP's electoral base comprises young male voters who are pro-European and more inclined to vote according to economic concerns.

<sup>3</sup>Political upheaval will not be discussed.

<sup>4</sup>One of them is the local industrial project (military tank production) that the local university, Erciyes University, takes part in for the province of Kayseri, (Özcan, 2006).

influences children's education. On average, most adults attain the same education level as their father. Strikingly, for the highest (college) and lowest (less than secondary) education levels, the probabilities of children matching their father's education level are very close, at 66% and 68% respectively. 1, however, only presents a partial picture as it does not sufficiently reflect the barriers that had led to the creation of different various new social and political institutions. The 1980s and 1990s witnessed growing institutional investment by the so-called conservative social class or the periphery (with the social cleavage termed by Mardin (1973)).

In simple terms, 1 indicates that wealthier families had more resources to send their children to college. In order to understand how students sort at post-secondary level, we have to give a brief history of university entrance procedures in Turkey. Until 1974, the selection mechanism was decentralized, being left to the discretion of universities. Then, a universalized system was implemented, with a central exam that was intended to offer fair evaluation for students from poorer families.<sup>5</sup> Borrowing Mardin's division concept, this change in selection narrowed the center-periphery gap in higher education. However preparation for the entrance exam requires families to use extra resources to send their children to better high schools or attend private tutoring classes. Thus, in terms of inequality between loosely defined social classes, the central entrance exam posed a challenge that led to the private provision of services inside Islamic or conservative organizations or networks to access higher education. In a sense, the service they provide substitutes the public one by preparing students from relatively poor family backgrounds for the central entrance exam for undergraduate studies. Specifically, these services include grants covering expenses for private tutoring classes and financing a student dormitory if these students are not able to afford or find a public one. The insufficient quality of public high schools is compensated for by the private education that certain conservative groups compete to provide. These network services, some of them substituting for the public, continue to operate while students are at university and even after the graduation in the form of career building. Network connections are mutually beneficial and can be defined as an implicit contract between individuals and the network. In this way, religious networks justify their social existence and finance the services they provide. In addition, the network, besides all these benefits, decreases transaction costs related to job seeking and further helps to develop

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<sup>5</sup><http://www.osym.gov.tr/belge/1-2706/tarihsel-gelisme.html>

Table 1: Intergenerational Educational Mobility and Average Income Positioning

		Less than Secondary		Secondary		Post-secondary	
		(1)	(2)	(1)	(2)	(1)	(2)
Father	Less than Secondary	2.32	0.68	3.13	0.24	4.23	0.08
Father	Secondary	2.82	0.13	3.31	0.46	4.24	0.42
Father	Post-secondary	2.57	0.04	3.59	0.30	4.38	0.66

Source: Author's calculations based on 2007 Adult Education Survey (AES), include adults aged 25 years or above.

(1) Average score or positioning according to the quantiles of income (5 highest, 1 lowest).

(2) Education level conditional on father education. The numbers add to one across the rows for each father education level.

business relations inside networks.<sup>6</sup>

As higher education institutions change due to major bureaucratic or political interventions, various social and individual strategies are needed to pass through the bottleneck created by the central exam. To capture this institutional context, a brief history of developments related to the university system is needed. Several major changes concern the selection mechanism governing the transition from high school to post-secondary level and the regulations and rules within universities. Until 1984 (except for some private enterprises in the mid-70s), the university system was entirely dominated by public universities. After the military coup in 1981, the higher education system fell under the control of a centralized institution and began to operate under the supervision of the Council of Higher Education (COHE-YÖK).<sup>7</sup> After legal restrictions were lifted in 1984 a new type of private (but non-profit institution or vakif) university appeared. For the public universities, meanwhile, there were two waves of proliferation. In the first wave in 1992, 22 new universities were founded under the rule of a coalition of the center right (DYP) and center left (SHP). This was a political move to facilitate a demand shift to the regions where each university campus was located. Higher local demand externalities is a common argument of local interest groups. After the first wave, whereas the number of state universities did not increase further, private (vakif) universities continued to increase. By 2006, there were 77 universities, of which 24 are privately owned.<sup>8</sup> In 2006, JDP accelerated the creation of new universities, mostly in Anatolia, that had ceased after 1992. The introduction of private universities provided easy access to tertiary education at a cost that was particularly affordable to wealthier families whose children got lower scores in the entrance exam.<sup>9</sup> Since 2006, the number of state universities has nearly doubled to 103. The other

<sup>6</sup>These institutions financed by certain religious networks could only operate somewhat in an informal way.

<sup>7</sup>CoHE was designed by the military coup in a way that allowed it to involve itself in staff recruitment policy, control budgetary decisions and regulate university elections.

<sup>8</sup>They are mainly located in two major cities, Istanbul and Ankara.

<sup>9</sup>Until 2006, private universities were located in two major cities, Istanbul and Ankara. In that sense, opening a

reason was the promotion of the local development policy that new universities bring together, (Arap, 2010). It is a way of importing demand for small cities that lack a large industrial sector. The choice of location may depend on various factors. For example, McLendon et al. (2009) found strong empirical evidence that, independent of other factors, partisanship, legislative professionalism, term limits, interest groups and gubernatorial power influence appropriation levels.

Political developments in the late 1990s led to a number of restrictions affecting educational equity and mobility. A social and political agenda to redesign the education system was dictated to the coalition parties (True Path Party and Welfare Party<sup>10</sup>) by the military wing of the National Security Council (NSC) in 1997. One of the major changes involved a new selection mechanism that subjected religious vocational school graduates (RVS-imam-hatips) to a reduced exam score coefficient that downgraded their total scores in the university central exam. The rationale behind the coefficient factor that disadvantaged RVS graduates in entering (or choosing) university faculties other than theology was to discourage families from sending their children to religious schools if they wanted access to all options in post-secondary education. This intervention in the selection process reduced the enrollment rates for RVS (imam-hatips), with the number of students decreasing from 511,502 to 77,392 between 1997 and 2002, (Ozgun, 2011). Another NSC intervention related to the regulations dictated to the CoHE was the reinforcement of the headscarf ban for female higher education students, which had previously been left to the discretion of the authority of each university. The official prohibition on the headscarf was not limited to universities but applied to all employees in all public sectors as well.<sup>11</sup> These restrictions meant that children with conservative (or religious) family background faced a number of obstacles in accessing higher education. The challenges were especially demanding for girls, starting at high school and even continuing during their working life, such as in the public sector where women are concentrated.<sup>12</sup> Their job opportunities were limited to the private sector, which is less developed in small cities. Such restrictions also applied to children whose mother tongue is Kurdish and residing in underdeveloped regions with poor family backgrounds. It is not possible to account for the gradual effect of these

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private university in a relative poor region seems less profitable.

<sup>10</sup>A center right and Islamic party coalition.

<sup>11</sup>The rule that women wearing a headscarf are not allowed to become public servants dates back to the 1980 military coup.

<sup>12</sup>Lawyers, doctors and school teachers at every level are barred from wearing head scarves.



restrictions on educational and income inequality. The political claims to unwind disadvantages were barely expressed or debated publicly following JDP's first general election victory in 2002. JDP's political discourse seemed to be vaguely involved in these claims publicly, while the headscarf ban was relaxed by decree in 2007 universities and no constitutional changes were made until the referendum in 2013. Meanwhile, the imposition of different coefficients for RVS ended in 2010 so entrance scores became based on a fair evaluation for students from all high school types.

## **2.2 Redistribution and Regional Development**

In this institutional setting, closing the welfare gap between regions and offering more egalitarian grant allocations are politically lucrative for the central government. Regionalisation of the political landscape is a common finding in the voting literature, (Tezcür, 2012), (Başlevent et al., 2005). Özcan (2006) suggests that devolution does not provide a clear solution to the development problem, arguing that centralized government can enhance equity and efficiency more than decentralized can. Luca and Rodríguez-Pose (2014) recently claimed that, under JDP rule between 2004 and 2012, public investment was motivated by socio-economic principles rather than political motives, explaining this finding in terms of the Turkish bureaucracy's strong developmental state capacity. Further study is needed to identify the nature of such policy (pork-barrel politics rather than patronage networks, which are hard to capture in a macro analysis). Ultimately, the basic question is whether public goods are allocated on an equity basis. In Greece, for example, Rodríguez-Pose et al. (2015) found that public funds are allocated in favor of pork-barrel politics rather than principles aiming at reducing regional disparities.

Investing in higher education in small cities and funding universities only represent a limited part of public expenditure. We should note that public expenditure in Turkey related to higher education has a separate budgeting procedure and is not reported as grants from central government to local authorities. Local authorities are not entitled to finance major development projects through their own budgets without the approval of central government. Table 2 displays to the extent that each wave of new universities changed the composition of expenditure in the consolidated budget in different years.

Table 2: Reprioritization and Share of Public Universities\*

Years	All	Before 1992		Between 1992-2006		After 2006	
	(1)	(1)	(2)	(1)	(2)	(1)	(2)
1990	4.123	4.123	1.00	-	-	-	-
1991	3.960	3.960	1.00	-	-	-	-
1992	4.318	4.318	1.00	-	-	-	-
1993	3.696	3.396	0.92	0.300	0.08	-	-
2000	2.684	2.064	0.77	0.620	0.23	-	-
2005	3.403	2.530	0.74	0.874	0.26	-	-
2006	3.092	2.270	0.73	0.806	0.26	0.016	0.01
2007	3.180	2.270	0.71	0.812	0.26	0.099	0.03
2008	3.240	2.152	0.66	0.865	0.27	0.223	0.07
2009	3.341	2.142	0.64	0.843	0.25	0.356	0.11
2010	3.514	2.151	0.61	0.837	0.24	0.525	0.15
2011	4.152	2.583	0.62	0.952	0.23	0.617	0.15
2012	3.939	2.317	0.59	0.901	0.23	0.721	0.18

Source: General Directorate of Budget and Fiscal Control. Last accessed on 22/06/2015 [http://www.bumko.gov.tr/EN\\_2679/budget-figures-and-budget-realizations.html](http://www.bumko.gov.tr/EN_2679/budget-figures-and-budget-realizations.html)

\* Based on year of foundation

(1) The share of year-end expenditures in the Consolidated Central Budget. (2) Share in total budget of Universities.

The share of universities in the central government budget has been about 3-4% and fairly stable despite the expansion of capacity with new universities. Table 2 provides evidence that funds were reallocated in favor of new universities in each wave. Over nearly two decades, the budget share of universities founded before 1992 declined to 59% while newly established universities, located mostly in small cities, increased their funding. The latest figures show that almost one fifth of the total university budget was spent on universities established under JDP rule.

Table 3: Regional University Enrollment and Regional Shares 2004-2012

Provinces	Nuts2										Enrollment Share		Enrollment Share of Girls	
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2004	2012	2004	2012
Istanbul	1	146,739	145,394	143,095	143,409	147,102	156,868	168,196	186,897	210,867	12.31	9.65	41.3	48.0
Edirne-Tekirdağ-Kırklareli	2	28,821	31,073	31,509	33,187	37,891	45,704	51,947	61,174	69,902	2.42	3.20	44.5	45.5
Bahkesir-Çanakkale	3	38,115	43,931	45,916	47,803	51,547	55,175	60,277	66,884	73,309	3.20	3.36	45.5	45.8
Izmir	4	72,758	77,492	79,331	80,194	82,171	87,739	92,099	100,632	108,093	6.11	4.95	43.6	46.2
Denizli-Aydın-Muğla	5	43,994	52,354	59,815	65,550	70,644	75,960	78,155	84,837	96,327	3.69	4.41	40.2	46.7
Manisa-Afyon-Kütahya-Usak	6	63,215	72,477	77,651	81,324	91,308	98,197	101,641	111,226	125,196	5.30	5.73	41.4	46.4
Bursa, Eskişehir, Bilecik (Open University)	7	73,680	76,597	77,736	74,964	79,005	84,826	91,105	102,209	108,554	6.18	4.97	44.1	46.2
Kocaeli-Sakarya-Düzce-Bolu-Yalova	8	88,023	101,052	110,829	114,298	121,213	128,250	134,358	148,597	162,269	7.39	7.43	37.9	43.7
Ankara	9	123,521	123,446	125,068	126,011	130,818	137,763	142,620	154,905	164,961	10.36	7.55	46.0	49.5
Konya-Karaman	10	60,075	68,559	73,351	72,480	72,723	75,417	74,646	80,512	86,732	5.04	3.97	43.5	46.4
Antalya-Isparta-Burdur	11	50,125	58,039	61,880	65,006	70,613	77,220	84,753	96,190	110,116	4.21	5.04	39.7	42.4
Adana-Mersin	12	46,572	49,460	50,133	52,026	54,929	59,980	61,804	67,744	72,628	3.91	3.32	38.3	43.6
Hatay-Kahramanmaraş-Osmaniye	13	26,201	29,056	30,872	33,303	37,162	41,594	45,816	51,953	58,265	2.20	2.67	31.9	37.5
Nevşehir-Aksaray-Niğde-Kırkkale-Kırşehir	14	38,578	40,577	41,011	40,332	44,571	50,902	57,999	70,040	77,624	3.24	3.55	39.7	45.1
Kayseri-Sivas-Yozgat	15	45,690	50,114	52,743	54,680	58,795	63,834	70,822	79,841	88,861	3.83	4.07	37.6	45.4
Zonguldak-Karabük-Bartın	16	17,373	19,332	20,461	21,189	22,920	25,491	30,393	38,209	48,656	1.46	2.23	35.7	41.2
Kastamonu-Çankırı-Sinop	17	13,097	13,585	13,369	13,475	14,285	15,113	17,511	21,733	26,312	1.10	1.20	37.8	43.2
Samsun-Tokat-Çorum-Amasya	18	38,110	41,619	42,766	44,567	49,390	55,296	60,388	69,575	77,844	3.20	3.56	41.8	48.1
Trabzon-Ordu-Giresun-Rize-Artvin-Gümüşhane	19	45,280	49,114	53,387	57,083	65,304	74,275	83,591	97,611	108,744	3.80	4.98	37.6	44.6
Erzurum-Erzincan-Bayburt	20	34,517	35,675	36,179	36,588	38,806	45,231	53,127	62,051	69,677	2.90	3.19	38.7	46.7
Kars-Ağrı-Iğdır-Ardahan	21	10,507	12,440	13,607	13,898	15,215	17,330	19,614	22,092	26,612	0.88	1.22	34.6	41.8
Malatya-Elazığ-Bingöl-Tunceli	22	32,859	34,849	34,856	34,798	36,644	41,909	49,069	58,511	68,639	2.76	3.14	32.1	41.2
Van-Mus-Bitlis-Hakkari	23	13,250	14,558	15,884	16,563	18,710	21,673	26,249	29,677	34,140	1.11	1.56	28.8	38.8
Gaziantep-Adıyaman-Kilis	24	13,875	15,591	17,164	18,865	22,987	29,858	36,475	42,401	47,014	1.16	2.15	36.9	44.2
Diyarbakır-Sanlıurfa	25	19,552	20,905	21,646	21,786	24,456	29,108	32,783	37,782	44,028	1.64	2.02	30.8	40.4
Siirt-Mardin-Batman-Sırnak	26	5,226	5,297	5,526	5,631	6,977	8,591	11,201	14,286	17,148	0.44	0.78	22.7	36.9
Total		1,191,757	1,284,591	1,337,791	1,371,017	1,468,194	1,605,313	1,738,649	1,959,580	2,184,530	100.00	100.000	41.8	45.8
Distance and Open Universities *		695,591	799,053	845,411	877,972	1,142,536	1,557,217	1,713,923	1,947,972	2,241,991				
Private (Vakif) Universities **		83,742	99,197	109,903	124,130	147,829	160,560	174,581	205,484	250,085				
Population aged 18-24		8,110,302	8,056,109	7,995,408	7,907,623	7,823,736	7,779,649	7,753,673	7,679,509	7,691,051				
Enrollment Rate ( Open Edu. Excl.)		15.7	17.2	18.1	18.9	20.7	22.7	24.7	28.2	31.7				

\* Statistics of Measuring, Selection and Placement Center \*\* Calculated using Statistics of Higher Education Council. Latest accessed on June 2015, <https://istatistik.yok.gov.tr/> \*\*\* Calculated using TurkStat Household Labor Surveys(2004-2013)  
Source: TurkStat Regional Statistics

Although funds have been reallocated towards new universities, total enrollment has been evenly distributed across all universities. In terms of the number of students enrolled, the government seems to have increased the burden of existing universities while creating new capacity through building new ones in each province. Table 3, which shows the evolution of higher education enrollment by NUTS2 regions, reveals several trends. Firstly, the total number of students enrolled, including private universities, more than doubled from 2004 to 2012 to reach almost 2.5 million students. Secondly, the post-secondary education age-population has gradually fallen by around 0.5% each year. The combined effect of expanding capacity and declining age population resulted in a remarkable increase in total enrollment rates (table 3, last row).<sup>13</sup> Although the situation in terms of regional share in enrollment is less intuitive, peripheral provinces have undoubtedly benefited from the expansion of higher education. Ankara, the capital province, and Istanbul lost around 3% while eastern provinces more than doubled the number of enrolled students compared to 2004. The expansion not only favored less developed eastern provinces but markedly changed the gender composition of enrollment between 2004 and 2013 in favor of females, as indicated in the final two columns of table 3. The gender gap closed in all regions, with the ratio of females pursuing higher education increasing to 46% since the wave of new institutions began in 2006. Lastly, table 3 shows that distance education also has become significantly important, particularly since 2008, reaching almost equal weight with traditional education.

Although these developments show that the coverage of higher education has expanded, the question remains as to whether these improvements have produced more equal opportunities. Previous studies have found that re-distributive character of subsidizing higher education is very limited, and Caner and Okten (2013) provides evidence that Turkey is no exception. Using special data from the central entrance exam of 2002, he found that subsidizing post-secondary education mostly benefits students from higher income and better educated families, with household income positively influencing the outcome of the entrance exam. Contrary to countries (Rozada and Menendez, 2002; Liu et al., 2006) with similar central entrance exams and dual (public and private) university systems, Caner and Okten (2013) found that students from higher income families in Turkey have a higher probability of enrolling in private universities.

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<sup>13</sup>Note that there was no significant supply pressure from secondary level graduates that would have stressed access to higher education during this period.

Table 4: Higher Education Credit and Hostels Institution Statistics

Years	Public Student Dormitories (No. Of Beds)			Number of Students accessing various public scholarships			Total Amount of various scholarships (Thousand Turkish Liras)		
	Girls	Boys	Total	Grant	Credit	Fee Waiver	Grant	Credit	Fee Waiver
2002	105,247	82,940	188,187	-	451,550	405,791	-	495,664*	124,477*
2003	106,390	83,357	189,747	-	494,070	428,270	-	362,776	73,342
2004	109,168	83,193	192,361	54,724	522,670	459,595	49,348	533,982	93,917
2005	111,898	84,436	196,334	98,110	537,031	481,011	123,570	680,059	113,389
2006	115,190	85,226	200,416	135,497	569,276	505,348	204,167	844,551	124,614
2007	117,441	86,290	203,731	168,923	572,552	451,842	298,532	961,674	127,171
2008	121,316	88,041	209,357	181,490	578,009	466,492	320,823	1,036,282	129,671
2009	132,089	93,024	225,113	198,707	587,131	474,792	375,601	1,213,653	141,242
2010	146,680	99,840	246,520	234,130	611,903	478,601	525,627	1,335,320	152,909
2011	159,866	107,180	267,046	320,912	592,582	494,024	804,125	1,646,005	159,366
2012	187,356	118,022	305,378	348,904	667,359	509,801	1,021,217	1,942,806	162,684
2013	188,920	116,954	305,874	395,679	706,512	**	1,205,588	2,250,046	**
2014	231,588	136,374	367,962	363,233	872,063	**	1,173,468	2,936,490	**

Source: General Directorate of Higher Education Credit and Hostels Institution. Annual Reports (2014, 2010,2009)

\* Cumulative sum between 1962-2002

\*\* By the year 2013, State university tuition fees are abolished for all students.

It is probable that these higher returns from post-secondary education constitute a strong incentive for families.

JDP has adopted several practices to accompany its expansionary policy. Higher education credit and grant coverage has increased significantly at every level, including graduate studies. In line with this, accommodation facilities for students have significantly been improved with the involvement of the Housing Development Administration (TOKI), which officially undertakes public housing investments, particularly since 2010.<sup>14</sup>

Table 4 displays public policies to facilitate local accommodation for students from other regions. Taken together, tables 3 and 4 show a remarkable increase in female access to and enrollment in new universities. Dormitory facility are particularly helpful for female students from conservative family backgrounds. By the end of 2012, nearly 1.5 million students gained access to education credits, grants or fee waivers.<sup>15</sup> In 2013, university fees were abolished for all students. We should note that without changing the selection mechanism, which, as Caner and Okten (2013) show, favors students whose parents can afford better high school quality and private tutoring, subsidizing tuition and family contributions by abolishing fees guarantees equity of access to higher education.

It is also worth noting that the increased demand for housing facility coming from students must have put pressure on rental prices, which benefited rentiers. It is possible that local housing developments and the increasing number of students are correlated and have some kind of pecuniary externalities. Non-pecuniary externalities might include certain service

<sup>14</sup>Law no. 6082 dated 25.11.2010. <http://www.resmigazete.gov.tr/eskiler/2010/12/20101210-1.html>

<sup>15</sup>University fee waiver and grants are means-tested and generally depend on parental income level.

Table 5: Enrolled College Students as % of Working Population in NUTS2 regions

	Ratio of Enrolled Students (% of population 15-65)*						Service Sector Value-added Growth (per capita)**		
	2004	2006	2009	2010	2011	2012	2004-2007	2007-2009	2009-2011
Istanbul	1.8	1.7	1.8	1.9	2.1	2.3	19.2	-1.7	13.3
Edirne-Tekirdağ-Kırklareli	3.3	3.4	4.4	4.9	5.5	6.0	30.7	-0.9	13.2
Balıkesir-Çanakkale	3.7	4.4	5.1	5.6	6.2	6.7	29.0	4.1	4.6
Izmir	3.0	3.1	3.3	3.4	3.7	3.9	21.6	0.4	14.0
Denizli-Aydın-Muğla	2.8	3.5	4.2	4.2	4.5	4.9	24.7	1.6	3.1
Manisa-Afyon-Kütahya-Uşak	3.2	4.0	5.2	5.4	6.0	6.7	31.1	-2.0	6.7
Bursa, Eskişehir, Bilecik (Open University)	3.6	3.5	3.5	3.7	4.1	4.2	25.9	1.5	12.9
Kocaeli-Sakarya-Düzce-Bolu-Yalova	4.7	5.7	6.0	6.1	6.5	6.9	29.3	1.2	22.0
Ankara	4.4	4.2	4.3	4.4	4.7	4.9	16.1	4.0	8.2
Konya-Karaman	4.5	5.3	5.4	5.3	5.6	6.0	28.4	3.4	3.2
Antalya-Isparta-Burdur	3.4	4.0	4.6	4.9	5.5	6.0	21.0	1.8	12.7
Adana-Mersin	2.1	2.2	2.5	2.5	2.8	3.0	18.7	-0.7	15.5
Hatay-Kahramanmaraş-Osmaniye	1.7	1.8	2.4	2.5	2.8	3.0	24.6	2.5	17.0
Nevşehir-Aksaray-Niğde-Kırkkale-Kırşehir	4.3	4.5	5.4	6.0	7.2	7.9	30.9	-1.3	11.5
Kayseri-Sivas-Yozgat	3.3	3.7	4.4	4.8	5.4	6.0	25.4	-2.6	1.8
Zonguldak-Karabük-Bartın	2.6	2.9	3.7	4.3	5.5	6.8	15.0	-6.5	8.8
Kastamonu-Çankırı-Sinop	2.9	2.9	3.3	3.8	4.6	5.4	10.6	0.2	3.1
Samsun-Tokat-Çorum-Amasya	2.2	2.5	3.2	3.5	4.0	4.5	18.1	-0.2	10.9
Trabzon-Ordu-Giresun-Rize-Artvin-Gümüşhane	3.0	3.4	4.6	5.1	5.9	6.6	22.9	2.7	2.2
Erzurum-Erzincan-Bayburt	5.5	5.6	7.1	8.4	10.1	11.5	21.3	4.3	4.3
Kars-Ağrı-Iğdır-Ardahan	1.7	2.4	2.9	3.2	3.4	4.1	21.2	6.8	10.6
Malatya-Elazığ-Bingöl-Tunceli	3.5	3.6	4.1	4.7	5.4	6.3	23.0	6.0	2.9
Van-Mus-Bitlis-Hakkari	1.4	1.7	2.1	2.4	2.6	2.9	23.4	10.1	2.1
Gaziantep-Adıyaman-Kilis	1.1	1.4	2.2	2.5	2.9	3.1	19.3	1.3	15.6
Diyarbakır-Sanlıurfa	1.4	1.4	1.7	1.8	2.0	2.2	21.5	1.6	17.7
Siirt-Mardin-Batman-Sırnak	0.6	0.6	0.9	1.1	1.3	1.5	37.8	5.8	25.5

\* Source: TurkStat Household Labor Surveys (2004-2012). Population figures are calculated using factor weights.

\*\* Source: TurkStat Regional Statistics, last accessed on July 6, (<http://tuikapp.tuik.gov.tr/Bolgesel/anaSayfa.do>)

sectors emerging within these districts due to increased demand. It seems that this policy has attracted some complaints from local residents, whose concerns were echoed by the prime minister in claiming that mixed-gender student accommodation was against conservative values. As a result, female-only dormitories are being increased to match the growing demand. Table 4 shows that from 2009 to 2014, significant progress was made to increase the capacity of female dormitories, with the number of beds increasing by 100,000 in 5 years through the help of TOKI.

Enhanced access, accommodation and grants specific to post-secondary education have brought upheaval to networks already operating mostly through religious charity finance.<sup>16</sup> Without continuing the discussion on political or faith-based organizational networks, we need to mention that economic rents related to private provision may be weakened by public provision through a crowding-out effect. Thus, new local political rents will probably emerge around the local organization and provision of public services related to post-secondary education.

Increasing capacity by establishing new universities has another dimension in terms of political economy. Increasing enrollment and investment in higher education contribute to

<sup>16</sup>Faith-based organizations and movements, which gained power through private provision of accommodation and grants and has already established secondary education and private tutoring institutions. In fact, political welfare redistribution, which is more universal inevitably challenged conservative communitarian provision, which lasted nearly thirty years.

local development by promoting domestic demand. The left-hand side of Table 5 displays total enrolled public university students as a percentage of the working population of provinces while the right-hand side presents the growth of the service sector for comparison. The fact that in some regions total enrollment has increased far more than the working population reveals the contribution of demand created by this increased capacity. In small cities where the relative share of manufacturing is low, demand externalities maintained economic growth during the 2007-2009 recession.

### **3 Proximity Effect and Localization**

Expansion in higher education and increased university accommodation and grants facilities are expected to increase mobility in terms of access and regional dynamics. One probable outcome of these structural changes could take two channels. One is the usual cost effect, which is more important for less well-resourced families. Despite increased access, the costs associated with residing abroad may deter certain families. Thus, proximity will likely increase enrollment of local students. Turley (2009) argues that college proximity facilitates the transition to college for families both financially and emotionally. Turley (2009) finds that students from a lower family income background are more likely to attend a nearby college. She concludes that proximity helps to increase college enrollment of locals particularly for less well-resourced families. The second channel might be related to cultural values, which mostly concern female students and their families. Regarding the preferences of Hispanic students to attend nearby colleges, for example, Desmond and Turley (2009) argues that attitudinal familism (a strong sense of attachment to family members) can be a strong motive besides socio-economic factors. As already discussed, female college enrollment has increased dramatically in Turkey since the 2006 expansion (Table 3). We can argue that proximity may affect the increased share of female students through channels we can not identify through our data. In the US, Riegle-Crumb (2010) shows that both Hispanic and white females have higher enrollment rates than their male peers due to stronger academic performance and more academically oriented social relationships and networks. If we assume that, in poorer regions of Turkey, more conservative families are unwilling to send their daughters to distant cities, it is possible that college proximity serves as an incentive for local residents.

In order to show which regions were most affected, we ran a probit estimation for twelve NUTS1 regions in 2012 as a treatment to indicate the presence of college proximity.<sup>17</sup> We use yearly cross-sections of Household Labor Force Surveys (HLFS) between 2002-2014. HLFS provides detailed information on labor market outcomes, such as wages and working hours, using a representative sample at regional NUTS2 level. We estimated the following equ. 1:

$$Pr(PS_{i,t} = 1) = \phi(\beta_1 F_{i,t} + \beta_2 T_{i,t} + \beta_3 F_{i,t} * T_{i,t}) \quad (1)$$

where  $\phi$  is the cumulative distribution. The dependent variable  $PS_{i,t}$  is a dummy variable with the value 0 if the child is aged between 18 and 25, completed secondary school but did not proceed to post-secondary level, and 1 if the child is aged between 18 and 25, completed secondary school and enrolled in a post-secondary institution. The subscripts indicate year  $t$ .  $F_{i,t}$  is a dummy variable with the value 1 if the father of the child completed secondary or post-secondary education and 0 if he has a lower level. We ran separate regressions for each NUTS1 region. In each estimation we were interested in the sign of the dummy variable to capture the interaction between the effect of paternal education and the year.<sup>18</sup>

Table 6 displays the probit estimation of students residing with their parents and attending nearby colleges. Localization might also reflect compositional change, meaning that less educated families increase relative to others but not necessarily at the level of sending children to college. Therefore, we have to look at the sign of the year effect. A negative and significant interaction term indicates that in the Eastern Black Sea, Northeast and Southeast Anatolia regions relative to year 2004, daughters whose father's education was less than secondary level are more likely to attend a local college whereas there is no such an effect for sons. It is interesting that there is significant and positive year effect for 2013 for both females and males. These results imply two complementary trends: one is that the presence of a nearby college increase the likelihood of local attendance; the other is that educational mobility is higher for females in conservative regions. We will call this effect localization in post-secondary education. We should note that the model bears some bias due to income effect in that college preferences are formed according to success in the central entrance exam. Children of wealthier families who

<sup>17</sup>The choice of treatment year does not mainly change sign of the effects. The regression table with 2013 as the treatment year is available upon request.

<sup>18</sup>Household labor surveys are addressed-based so household members residing elsewhere are not counted. Consequently, we do not include children who are enrolled in a distant college and not residing with their parents.



can provide better education and private tutoring can more easily access top-ranked colleges that are mostly located in major cities.

We can speculate that this trend has some effects on economic dynamics within each region although there are no studies directly evaluating the externalities of new universities on economic dynamics. Regional selection also has interesting effects on post-secondary education mobilization in that localization will slow down the regional mobility of the region's educated labor force, and may even help to develop a new kind of human capital formation with stronger local attachments. However, it is unlikely that these emerging universities will sufficiently meet the conditions to develop local dynamics and develop a critical mass given they are still new. Generally, these externalities could be significant for individual regions in that demand externalities can account to a remarkable point after 2006 when new universities expanded their capacity. In nearly half of the regions (13 out of 26), the ratio of students enrolled in post-secondary education exceeded 6% of the working population, with Table 5 showing an increase both through time and across all regions. Combined with distributive grants and a credit policy (Table 4), it would not be wrong to argue that the local demand created by college students, together with other externalities with real estate and housing, local dynamics has contributed to local economies throughout JDP's political tenure.

## **4 Regional Returns to Higher Education**

There is an extensive literature on returns to education and wage structure, and factors acting on wage inequality. USA-based studies mainly discuss the role of technology and labor market institutions. Despite an increase in the supply of workers with higher education, Acemoglu (2000) argues that technical change has been a driving factor in the rise of skill returns. David et al. (1997) provides evidence for skilled-biased technical change that favors the compensation of more highly educated workers. Barth and Lucifora (2006) found no effect of supply shock (higher education expansion) on the relative wage dispersion of skilled workers for 12 European countries. A number of studies, such as Bakis and Polat (2015) and Filiztekin (2015), discuss the importance of wage income in the structural transition to paid or more appropriately market labor. The net transition accounts for more than 10% of the labor force during the last decade. Most of these workers are prime wage earners that have moved from locally

defined jobs to market ones. This observation gains support from the fact that the previously locally tied network structure of cities has experienced a structural change to become more complex, more integrated and less communitarian. In Turkey's case, comparing the year effect in both regressions (Table 6), we see that for locals, the probability of attending post-secondary education has increased across all regions. There might be several factors acting on the decision to attend college. One might be the incentive created by higher marginal returns to post-secondary education. Another is the incentive to reside in rather than migrate from a region, which might reflect lower selective migration. If, for local marginal returns to higher education, there is a tendency to equate across regions, the localization effect is likely to persist, which justifies the college proximity argument. In order to account for these trends, we estimate a simple wage regression described in Equ. 2

$$\ln(hw)_{i,t} = \beta_0 + \beta_1 E_{i,t} + \beta_2 P_{i,t} + \beta_3 T_{i,t} + \epsilon_{i,t} \quad (2)$$

The sample for real hourly wage regressions is restricted to male wage earners aged 24-39 to avoid an insufficient number of observations and selection bias emerging from participation issues for women. In Equ. 2,  $P$ ,  $T$  and  $S$  stand for potential experience, firm-specific tenure and a public employee dummy respectively. Education  $E$  is taken as categorical and roughly grouped into four levels.<sup>19</sup> Table 7 summarizes the results of the basic Mincerian wage regression given in Equ. 2 for each region for pooled cross-sections of 2004-2005 and 2013-2014 data.

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<sup>19</sup>Salehi-Isfahani et al. (2009) argues that individual returns to years of education show non-linearities for Turkey

Table 6: Students attending post-secondary studies and residing with their parents (%)

NUTS1	Istanbul (1)	West mara (2)	Mar- Aegean (3)	East mara (4)	Mar- Anato- lia (5)	West Mediterranean (6)	Central Ana- tolia (7)	West Black Sea (8)	Black East Sea (9)	Black Northeast Anatolia (10)	Middle East Anatolia (11)	Black Southeast Anatolia (12)
<b>Girls</b>												
Father secondary education or above	0.738*** (0.091)	0.444** (0.196)	0.665*** (0.099)	0.484*** (0.113)	0.976*** (0.109)	0.612*** (0.121)	0.313* (0.164)	0.071 (0.153)	0.723*** (0.179)	1.133*** (0.212)	0.303 (0.192)	0.771*** (0.187)
Year 2012	0.520*** (0.082)	0.567*** (0.159)	0.413*** (0.086)	0.308*** (0.097)	0.552*** (0.097)	0.628*** (0.100)	0.460*** (0.143)	0.342*** (0.133)	0.926*** (0.153)	1.157*** (0.178)	0.763*** (0.163)	0.881*** (0.145)
Year 2012 * Father education	0.395*** (0.152)	0.380 (0.279)	0.218 (0.151)	-0.063 (0.170)	-0.026 (0.145)	-0.080 (0.169)	0.144 (0.225)	0.408* (0.232)	-0.417* (0.232)	-0.450* (0.262)	-0.298 (0.272)	-0.414* (0.236)
Constant	-0.730*** (0.056)	-1.204*** (0.125)	-0.860*** (0.056)	-0.791*** (0.066)	-1.001*** (0.075)	-1.222*** (0.075)	-0.988*** (0.107)	-1.147*** (0.079)	-1.338*** (0.122)	-1.492*** (0.151)	-1.198*** (0.132)	-1.536*** (0.123)
Observations	1,560	501	1,483	1,130	1,427	1,268	620	818	629	534	508	779
Pseudo R-squared	0.110	0.0834	0.0848	0.0301	0.125	0.0710	0.0467	0.0386	0.0905	0.161	0.0503	0.0812
<b>Boys</b>												
Father secondary education or above	0.660*** (0.085)	0.636*** (0.158)	0.636*** (0.092)	0.642*** (0.094)	0.804*** (0.101)	0.586*** (0.102)	0.405** (0.161)	0.219* (0.124)	0.575*** (0.177)	0.515*** (0.171)	0.456*** (0.143)	0.186 (0.146)
Year 2012	0.227*** (0.074)	0.341*** (0.121)	0.379*** (0.076)	0.036 (0.081)	0.416*** (0.081)	0.200** (0.081)	0.596*** (0.111)	0.219** (0.105)	0.620*** (0.129)	0.583*** (0.120)	0.401*** (0.122)	0.300*** (0.097)
Year 2012 * Father education	0.247* (0.132)	-0.318 (0.216)	0.061 (0.139)	0.069 (0.145)	-0.074 (0.132)	0.007 (0.150)	-0.043 (0.209)	0.376** (0.185)	0.279 (0.222)	0.267 (0.224)	0.140 (0.215)	0.378* (0.206)
Constant	-0.568*** (0.047)	-0.978*** (0.093)	-0.933*** (0.050)	-0.766*** (0.051)	-1.027*** (0.061)	-1.040*** (0.058)	-1.167*** (0.083)	-1.081*** (0.060)	-1.379*** (0.102)	-1.154*** (0.092)	-1.177*** (0.080)	-1.193*** (0.069)
Observations	1,870	772	1,893	1,675	1,864	1,764	939	1,277	852	798	870	1,263
Pseudo R-squared	0.0694	0.0294	0.0596	0.0444	0.0808	0.0371	0.0552	0.0357	0.117	0.0930	0.0518	0.0314

Robust standard errors in parentheses. \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Source: Household Labor Surveys (2004, 2012) according to regional NUTS2 level. Estimations include children aged between 18 and 25.

Table 7: Regional Returns to Education (Men aged 24-39)

NUTS1	Istanbul (1)	West mara (2)	Mar- mara (3)	Aegean (4)	East mara (4)	Mar- mara (5)	West Anato- lia (5)	Mediterranean (6)	Central Ana- tolia (7)	West Sea (8)	Black (9)	East Black (9)	Northeast Anatolia (10)	Middle Anatolia (11)	East (11)	Southeast Anatolia (12)
<b>2004-05</b>																
Primary	0.059*** (0.019)	0.121*** (0.030)	0.126*** (0.015)	0.069*** (0.021)	0.125*** (0.015)	0.151*** (0.020)	0.125*** (0.027)	0.059*** (0.020)	0.047 (0.034)	0.234*** (0.038)	0.056* (0.029)	0.134*** (0.023)				
Secondary	0.291*** (0.013)	0.368*** (0.027)	0.296*** (0.014)	0.320*** (0.014)	0.392*** (0.022)	0.402*** (0.020)	0.267*** (0.027)	0.213*** (0.020)	0.270*** (0.032)	0.342*** (0.034)	0.342*** (0.025)	0.328*** (0.020)				
Post-secondary	0.995*** (0.023)	0.741*** (0.039)	0.738*** (0.022)	0.686*** (0.027)	0.851*** (0.033)	0.894*** (0.031)	0.745*** (0.040)	0.555*** (0.030)	0.637*** (0.046)	0.784*** (0.049)	0.752*** (0.038)	0.796*** (0.032)				
Tenure	0.024*** (0.003)	0.043*** (0.006)	0.033*** (0.003)	0.056*** (0.003)	0.025*** (0.004)	0.034*** (0.004)	0.047*** (0.005)	0.043*** (0.004)	0.041*** (0.007)	0.035*** (0.007)	0.026*** (0.005)	0.023*** (0.004)				
Tenure Sq.	-0.058*** (0.016)	-0.161*** (0.033)	-0.136*** (0.014)	-0.186*** (0.017)	-0.095*** (0.020)	-0.122*** (0.023)	-0.174*** (0.027)	-0.149*** (0.040)	-0.185*** (0.019)	-0.101*** (0.030)	-0.071*** (0.026)	-0.074*** (0.019)				
Potential Exp.	0.059*** (0.006)	0.016* (0.009)	0.021*** (0.005)	0.021*** (0.006)	0.041*** (0.010)	0.031*** (0.007)	0.029*** (0.009)	0.029*** (0.008)	0.023** (0.010)	0.015 (0.011)	0.024** (0.010)	0.017** (0.007)				
Potential Exp. Squ.	-0.154*** (0.017)	-0.024 (0.030)	-0.038** (0.017)	-0.047** (0.018)	-0.081*** (0.030)	-0.061*** (0.023)	-0.070** (0.028)	-0.071*** (0.024)	-0.041 (0.033)	-0.012 (0.034)	-0.046 (0.030)	-0.032 (0.021)				
Public Employee	0.155*** (0.022)	0.479*** (0.025)	0.474*** (0.014)	0.335*** (0.016)	0.530*** (0.020)	0.608*** (0.019)	0.608*** (0.026)	0.794*** (0.019)	0.731*** (0.031)	0.812*** (0.030)	0.690*** (0.024)	0.758*** (0.020)				
Constant	0.791*** (0.043)	0.781*** (0.073)	0.748*** (0.044)	0.879*** (0.047)	0.553*** (0.077)	0.510*** (0.059)	0.575*** (0.071)	0.529*** (0.061)	0.629*** (0.079)	0.384*** (0.081)	0.630*** (0.078)	0.561*** (0.055)				
Observations	10,500	2,821	8,758	7,745	5,430	5,908	2,818	5,085	1,858	1,956	2,619	4,328				
R-squared	0.295	0.421	0.425	0.375	0.430	0.497	0.568	0.552	0.606	0.629	0.609	0.636				
<b>2012-13</b>																
Primary	0.091*** (0.011)	0.058*** (0.018)	0.064*** (0.012)	0.075*** (0.013)	0.078*** (0.013)	0.073*** (0.016)	0.059*** (0.019)	0.076*** (0.022)	0.021 (0.026)	-0.047* (0.027)	0.048** (0.023)	0.073*** (0.019)				
Secondary	0.304*** (0.011)	0.218*** (0.018)	0.252*** (0.012)	0.250*** (0.013)	0.250*** (0.012)	0.227*** (0.015)	0.162*** (0.018)	0.183*** (0.018)	0.109*** (0.024)	0.132*** (0.025)	0.143*** (0.022)	0.234*** (0.020)				
Post-secondary	1.010*** (0.019)	0.596*** (0.026)	0.700*** (0.021)	0.743*** (0.021)	0.796*** (0.021)	0.702*** (0.023)	0.594*** (0.027)	0.568*** (0.026)	0.558*** (0.036)	0.617*** (0.037)	0.716*** (0.033)	0.883*** (0.029)				
Tenure	0.021*** (0.003)	0.024*** (0.003)	0.025*** (0.003)	0.029*** (0.003)	0.023*** (0.003)	0.022*** (0.003)	0.019*** (0.003)	0.014*** (0.003)	0.019*** (0.005)	0.007 (0.005)	0.012*** (0.004)	0.033*** (0.004)				
Tenure Sq.	-0.070*** (0.016)	-0.071*** (0.018)	-0.089*** (0.015)	-0.087*** (0.017)	-0.108*** (0.018)	-0.079*** (0.018)	-0.056*** (0.020)	-0.028 (0.019)	-0.052** (0.026)	0.001 (0.028)	-0.038 (0.024)	-0.146*** (0.024)				
Potential Exp.	0.062*** (0.005)	0.035*** (0.006)	0.045*** (0.005)	0.050*** (0.005)	0.046*** (0.004)	0.050*** (0.005)	0.037*** (0.006)	0.036*** (0.006)	0.037*** (0.008)	0.032*** (0.008)	0.029*** (0.007)	0.043*** (0.007)				
Potential Exp. Squ.	-0.146*** (0.014)	-0.087*** (0.018)	-0.111*** (0.014)	-0.119*** (0.015)	-0.112*** (0.014)	-0.121*** (0.017)	-0.101*** (0.019)	-0.084*** (0.019)	-0.099*** (0.027)	-0.094*** (0.026)	-0.088*** (0.023)	-0.107*** (0.021)				
Public Employee	0.305*** (0.016)	0.642*** (0.018)	0.569*** (0.016)	0.425*** (0.017)	0.569*** (0.014)	0.608*** (0.018)	0.716*** (0.020)	0.733*** (0.018)	0.692*** (0.025)	0.677*** (0.026)	0.624*** (0.023)	0.532*** (0.021)				
Constant	0.941*** (0.038)	1.053*** (0.045)	0.944*** (0.038)	1.002*** (0.038)	0.983*** (0.036)	0.875*** (0.043)	1.046*** (0.048)	0.997*** (0.047)	1.032*** (0.067)	1.096*** (0.063)	0.774*** (0.058)	0.774*** (0.055)				
Observations	9,641	4,658	8,430	7,453	9,958	7,419	4,283	4,716	2,635	3,086	3,384	5,286				
R-squared	0.467	0.559	0.529	0.463	0.568	0.522	0.621	0.589	0.579	0.578	0.575	0.557				
<b>Marginal Returns to Post-secondary Education</b>																
Post-secondary to Secondary																
2004-05	0.70	0.37	0.44	0.37	0.46	0.49	0.48	0.34	0.37	0.44	0.41	0.47				
2013-14	0.71	0.38	0.47	0.49	0.55	0.48	0.43	0.39	0.45	0.49	0.57	0.65				
Post-secondary to Primary																
2004-05	0.94	0.62	0.61	0.62	0.73	0.74	0.62	0.50	0.59	0.55	0.70	0.66				
2013-14	0.92	0.54	0.64	0.67	0.72	0.63	0.54	0.49	0.54	0.66	0.67	0.81				

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Year effect is controlled for and reference year is 2004 for 2004-05 and 2012 for 2012-03 pooled cross-sections.  
Source: Household Labor Surveys (2004,2005, 2012, 2013) according to regional NUTS1 level. Estimations include wage earners aged 25-39.  
Marginal returns are the difference between coefficients for education levels.

The last rows of Table 7 show marginal returns to post-secondary education with respect to secondary<sup>20</sup> and primary level. Compared to the 2004-05 pooled regressions, marginal returns to secondary education to post-secondary has increased in regions where higher education has expanded, particularly for Turkey's eastern provinces, although this does not hold for primary education level. For 1988, 1994 and 2003, Salehi-Isfahani et al. (2009) found that marginal returns to graduating from post-secondary level with respect to secondary level increased. He argues that the increasing trend of marginal returns despite the expansion of education is related more with labor demand conditions and the sophisticated structure of the economy, since a similar expansion in Iran did not result in increases for individual returns.<sup>21</sup> Higher returns to college might reflect technological changes which favor skilled labor. Bakis and Polat (2015) also argues that it is rather skill biased structural change, implying that within effects are larger than between effects. Whatever the reason behind the higher relative marginal returns, increased labor demand coupled with economic growth stimulate attendance of higher education in the eastern region. Another interesting results is the public-private differential, whereby public employees earn more than private ones but still the premium increases in less developed regions. This implies that amenity differentials compensated in public sector. The fact that Istanbul has the highest marginal returns to post-secondary education supports the claim that highly educated workers sort into regions like Istanbul as Turkey's largest city. Related to our previous remark on localization, regional estimates show that, in terms of returns, there is a slow convergence over time.

Several implications from these findings for female wage earners need to be emphasized. It is evident that expansion of education at every level increases labor force participation for younger generations, (Dayioğlu and Kırdar, 2010). For higher education, this upward trend should be coupled with an expansion of public sector jobs where gender selection is more likely. From the perspective of political economy there are two implications. Firstly, the public sector, being a major employer in the field of education and health, should grow to address the needs of mothers for childcare and elderly health in order to increase labor participation rates.<sup>22</sup>

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<sup>20</sup>Regular and vocational high schools are merged into one category in order to avoid confusion.

<sup>21</sup>Salehi-Isfahani et al. (2009) found a higher returns to education for 2003 with a sample including individuals aged 20-59 and estimations basically involving potential experience and education variables. Tansel and Bodur (2012) found a decline in returns to education for 2002 compared to 1994, which he attributed to insufficient labor demand due to the 2001 crisis.

<sup>22</sup>Bakis et al. (2013) reports that increasing the college share of employment in regions promotes social returns to education, particularly for women.

Secondly, the political demand for gender-specific job creation will increase with the additional supply of educated women that have benefited mostly from the removal of restrictions on access to public work for women wearing head-scarves and from localization in more conservative regions, as already discussed.

## **5 Conclusion**

This paper focused on the economic and political consequences of higher education expansion in Turkey in the last decade. The creation of new universities, which was initiated as a political move targeting regional development, emerged as a re-distributive policy reorienting public investment and funds toward poorer eastern regions of Turkey. This expansion, which has almost doubled enrollment rates since 2004, was accompanied by a subsidy policies facilitating more education grants and fee waivers, and heavy investment in public student accommodation. We provided a detailed account of regional dynamics and developments around the new emerging universities. We also discussed the institutional background regarding several restrictions on access to higher education which marked a series of political events inherited from the decade before JDP came to power. In terms of economic consequences, JDP's expansion policy has affected local economies through demand externality which, in some regions, doubled the share of enrolled students and channeled more public investment and expenditure. These developments have also significantly reduced gender differences in regional college enrollment rates. We highlighted several impacts of this expansion on labor market dynamics. Firstly, it had a re-distributive effect for daughters from families with low parental education levels, through what we call 'localization'. Secondly, there was (slow) convergence in terms of marginal returns to higher education as compared to the pre-expansion period.

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