Some Economic Consequences of Higher Education Expansion in Turkey

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May 2016

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Version: 1 February 2017

Abstract

This article discusses the recent expansion and structural changes in the Turkish higher education and analyses a number of economic consequences in terms of equity and returns across regions. First, we outline the institutional background of the expansion in order to identify various re-distributive dimensions of the policy. Using household labor force surveys between 2004 and 2013, we explore whether college proximity affects local families' access to college. Our results show that this policy had an equity-enhancing effect for daughters of low-educated households in some regions with large-scale expansion. Second, we investigate whether the compositional change has affected local returns to college degrees and contributed to the relative convergence across regions. The estimation results show that despite the increase in college graduates, returns in terms of wages at the local level has increased increasing and that some regional convergence was attained.

Keywords: Higher education ; Returns to Education;College Proximity; Turkey
JEL Classification: I23; I26; R23

1 Introduction

Institutions designing higher education have economically and socially significant effects by determining and reproducing the selection mechanisms that match ability and rewards in a society. The limited supply of higher institutions and the costs associated with access and attendance are key factors helping to evaluate the degree of equality of opportunities and the efficiency of higher education systems. Since the early 1970s (Hansen and Weisbrod, 1969), the question of whether allocating more public resources to higher education is equity enhancing or equity impeding has been widely debated. More recent discussion has focused on the positive and negative selection of likely college attenders regarding educational expansion. Choi (2015) studies the impact of expansion on college earnings in South Korea and finds that the expansion has mostly benefited female compliers through human capital effect. Brand and Xie (2010) find a negative selection effect of educational expansion in the US, indicating that

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those who are less likely to attend college benefit most from college. Blanden and Machin (2004) discuss how higher education expansion in the UK has mostly benefited richer families. To the degree that the expansion of higher education reaches a wider portion of society and hence has a more egalitarian character with a more democratic contribution, it is likely that the political landscape and competition will change in the long run. Iversen and Stephens (2008), however, note that higher education seems less re-distributive than public investment in primary and secondary education.

Higher education expansion in Turkey was initiated in 2006, with the number of public universities more than doubling to 103 by 2014. Additionally, improved re-distributive grant and accommodation policies increased higher education access rates from 15.7% in 2004 to 31.7% by 2012. Gender inequality in access to higher education substantially decreased and regional gender disparities declined. Evaluating the policies associated with expansion at this scale requires a better understanding of the political and institutional background, and more attention to country-specific selection mechanisms related to higher education. Turkey's higher education institutions have the dynamic character necessary to keep up with 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, the issue of public finance for the burdensome costs of higher education has a re-distributive character. In this study, we first provide a short history of Turkey's higher education institutions and the major changes that they underwent. We draw attention to the social and economic changes that can be related to Turkey's expansion of post-secondary education by providing an account of the institutional background and complementary policies (grants and accommodation) related to the expansion. Our main argument is that, since 2006, newly emerging universities have expanded into relatively less developed regions, which has implications for regional economic structures. We observe two major local labor market outcomes of this expansion, one is the localization of labor force suggesting increased college access with proximity, and the other is the convergence of relative returns to education across regions.

The structure of the this paper is as follows. The next section provides a brief economic and political account of recent developments concerning the latest expansion of higher education in Turkey and descriptive statistical evidence on various dimensions of the expansion. We 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)[1] have contributed to local development via a re-prioritization of public investments and demand externalities through increased public grants and accommodation facilities targeting college students. In this sense, the expansion offers beneficial local political windfalls as well as equality enhancing educational opportunities. It seems that this policy shift will have long-term consequences that are likely to affect Turkey's social and economic structure. One important finding relates to improvements in gender equality in access to

[1]the JDP is the translation of the Turkish name for Adalet ve Kalkinma Partisi (AKP)

college, particularly in regions where the scale of expansion is greater. In the third section, we focus on one of the re-distributive outcomes of the expansion. Using a difference-in-difference model, we try to determine whether college proximity produces a redistributive effect and increases access for local families. We find that local enrollment has increased for both boys and girls following the capacity increase in new universities, particularly for new universities in eastern regions where the expansion is larger. When the intergenerational (paternal education) effect is included, we find that for girls, low-educated households have benefited more from college proximity. The fourth section discusses the impact of the 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 the marginal returns of graduating from college.

2 Investing in Higher Education

During its relatively long tenure in government, the JDP has shown its willingness to expand higher education and improve access in favor of its electorate at the time of the expansion, but without paying much attention to the lagging changes in institutional structure. 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.[2] This 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 at the provincial level. 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 local public goods.[3]

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. Column 1 in Table 1 indicates average positioning of education pairs of two generations (Father and Adult) according to quintiles of the income of the adult. Column 2 is the average transition of intergenerational education pairs. The earnings' gap between different education levels which is measured by average positioning according to the quantiles of income (5 highest, 1 lowest)) implies that better-educated people have higher

[2]Turkey remains one of the few OECD countries where public finance is mostly centralized (Blöchliger and Rabesona, 2009).

[3]As an interesting case, Özcan (2006) discusses the issue of large-scale local spending around three development projects. One of them is a local industrial project (military tank production) that the local university, Erciyes University, participated in for the province of Kayseri, Özcan (2006). Initiated with the approval of central government, it failed due to the inability of local political groups and the central authority to coordinate.

returns. In terms of intergenerational effect, having an educated father slightly increases average income positioning (column 2). Table 1 depicts the impact of the father's education level on the social inheritance which affects 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. Table 1, however, only presents a partial picture for the institutional backgound of the intergenerational mobility. Higher social aspirations have led to the creation of different new social and political institutions which aimed at overcoming the barriers linked to college access.[4] We will provide a brief discussion in the next section.

2.1 Political and Institutional Background

In order to understand how students sort at post-secondary level in Turkey, we have to give a brief history of university entrance procedures and its evolution. We will focus on major factors affecting the selection mechanism and higher education expansion. One major change is related to the conduct of the entrance exam, which determines the competition among students and private provision. The second important aspect is the relationship between political interests and the evolution of the public university system. Third, we discuss institutional restrictions and political interventions in the system, and their relevance for the inclusion of social groups.

Until 1974, the selection mechanism was not centralized, being left to the discretion of universities. A standardized system was then implemented[5], with a central exam that was intended to offer fairer evaluation for students. This change in selection narrowed the higher education gap between social groups having different socio-economic backgrounds. However, substituting the former with a more standardized evaluation has encouraged competition among students, which entails preparation for the central entrance exam. In this competitive system, households need extra resources to send their children to better high schools and/or private tutoring classes (*dershane*).[6] Berberoğlu and Tansel (2014) show that the demand for private tutoring is higher among parents having higher education levels and who more likely to have the resources. Thus, in terms of mobility and inequality, the central entrance exam has posed a challenge for disadvantaged social groups.[7]

The selection mechanism governing the transition from high school to post-secondary level, and the rules and regulations within universities have undergone major changes. Following 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). [8] Until 1984 (except for few short-lived private higher education institutions in the

[4]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)).

[5]http://www.osym.gov.tr/belge/1-2706/tarihsel-gelisme.html

[6]Tansel and Bircan (2006) report that families spend more than 1.4 per cent of GDP on private tutoring in Turkey.

[7]For example, the provision needed for private tutoring has led to private provision supported by conservative groups and networks.

[8]CoHE (YÖK) was designed by the military coup in a way that allowed it to involve itself in staff recruitment

Table 1: Intergenerational Educational Mobility and Average Income Positioning

		Adults					
		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 income quantiles (5 highest, 1 lowest). For example, the adults who have attained secondary education level as their father have an average income score of 3.31 on a scale of 1 to 5.
(2) Education level conditional on father education. The rows add to one across father's education level.

mid-70s), the university system was entirely dominated by public universities. A new type of private (but non-profit institution or vakif) university appeared when legal restrictions were lifted in 1984. For the public universities, meanwhile, there were two waves of proliferation (Figure 1). In the first wave, in 1992, twenty-two new universities were founded under the rule of a coalition government between the center-right (True Path Party -DYP) and center-left (Social Democratic Populist Party - SHP) parties. After this first wave, while the number of public universities did not increase further, private (vakif) universities continued to boost. By 2006, there were seventy-seven universities, of which twenty-four were privately owned. In 2006, the JDP accelerated the creation of new public universities, mostly in Anatolia. The introduction of private universities provided easy access to tertiary education at a cost that was particularly affordable to wealthier families.[9] Since 2006, the number of public universities has nearly doubled to one hundred and three.[10]

The expansion policy carries a political motive to promote the local development policy (Arap, 2010) and to facilitate demand shift at the local level. Local interest groups show political support with the argument that new universities trigger higher local demand externalities. 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.[11] For example, McLendon et al. (2009) find strong empirical evidence that, independent of other factors, partisanship, legislative professionalism, term limits, interest groups and gubernatorial power influence appropriation levels.

In the late 1990s, increasing political conflict between secular and conservative parties led to a number of restrictive regulations likely to affect inclusion based on educational equity and mobility. In 1997, a social and political agenda to redesign the education system was dictated to the coalition parties (True Path Party and Welfare Party[12]) by the military wing of the National Security Council (NSC). There were two major restrictions imposed on the selection mechanism. One involved a new design that subjected religious vocational school graduates (RVS-imam-hatips) to a reduced exam score coefficient, thereby reducing their total scores in

policy, control budgetary decisions and regulate university elections.

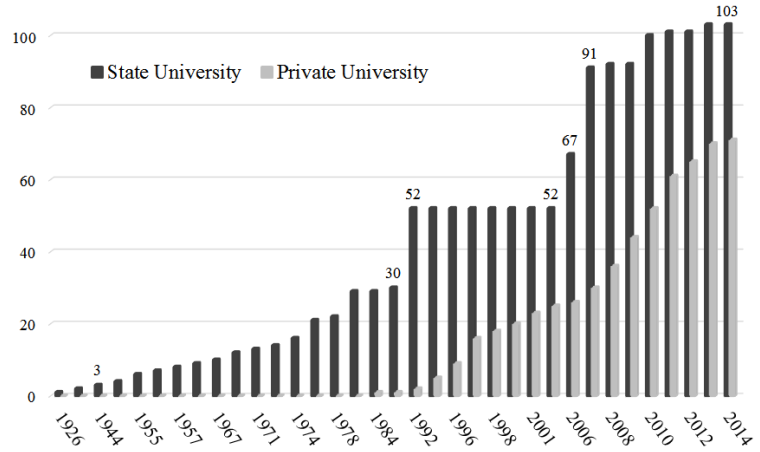
[9] In contrast to public ones, most private universities accept students with lower scores in the entrance exam. Until 2006, private universities were located in two major cities, Istanbul and Ankara. In that sense, opening a private university in a relatively poor region seems to have less economic motivation.

[10] Altinsoy (2011) argues that emerging universities are less effective in terms of quality.

[11] Arap (2010) reports that political preferences were a major factor behind behind the proliferation of universities.

[12] A center-right and Islamic party coalition.

Figure 1: Evolution of Higher Education Institutions (number of establishment by year)



Source: Statistics of Higher Education Council

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, with the number of students decreasing from 511,502 to 77,392 between 1997 and 2002 (Ozgur, 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.[13] These restrictions meant that children with conservative (or religious) family backgrounds 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.[14] Their job opportunities were limited to the private sector, which has a smaller share in less developed small cities than the public sector. The political aim to unwind these disadvantages was barely expressed or debated publicly following the JDP's first general election victory in 2002. The JDP's political discourse seemed to be vaguely involved in these claims publicly, while the university headscarf ban was relaxed by a decree in 2007, no constitutional changes were made until the referendum in 2013. Meanwhile, the imposition of different coefficients for RVS ended in 2010 so that the entrance scores were thereafter based on a standard evaluation for students from all high school types.

[13]The rule that women wearing a headscarf were not allowed to become public servants dates back to a circular issued by the Republican People's Party in 1978 (Bayram, 2009). The regulation remained in force after the 1980 coup d'Etat.

[14]Lawyers, and doctors and school teachers in the public sector were barred from wearing head scarves.

2.2 Redistribution and Regional Development

In this institutional setting, specific to the Turkish system, where central government is the major decision maker in public expenditure, closing the welfare gap between regions by offering more budget/grant allocations seems to be a lucrative policy. However, it is important to note that this strategy depends on expected, if not existing, electoral support for the governing party at the regional level. Regionalisation of the political landscape, which is a common finding in the voting literature on Turkey (Tezcür, 2012), and economic voting motives (Başlevent et al., 2005) give further political rationale to the JDP's grant allocation policy. Several papers have discussed the role of central government within Turkey's development perspective. Özcan (2006) suggests that devolution does not provide a clear solution to the regional development problem, arguing that a centralized government can enhance equity and efficiency more than a decentralized can. Luca and Rodríguez-Pose (2014) recently claim that under the JDP rule between 2004 and 2012, public investment was motivated by socio-economic principles rather than political motivation, confirming the regional welfare gap argument. They explain this finding using the strong developmental state capacity of the Turkish bureaucracy. Ultimately, the basic question is whether public goods are allocated on an equity basis. Further study is needed to identify the nature of such a policy with micro data (pork-barrel politics rather than patronage networks, which are hard to capture without micro-data). In Greece, for example, Rodríguez-Pose et al. (2015) find that public funds are allocated in favor of pork-barrel politics rather than according to principles aiming at reducing regional disparities.

Table 2: Reprioritization and Share of Public Universities*

	Budget shares of universities (grouped according to establishment year)						
Years	All	Before 1992		Between 1992-2006		After 2006	
	(1) (%)	(1) (%)	(2) (%)	(1) (%)	(2) (%)	(1) (%)	(2) (%)
1990	4.12	4.12	1.00	-	-	-	-
1991	3.96	3.96	1.00	-	-	-	-
1992	4.32	4.32	1.00	-	-	-	-
1993	3.70	3.40	0.92	0.30	0.08	-	-
2000	2.68	2.06	0.77	0.62	0.23	-	-
2005	3.40	2.53	0.74	0.87	0.26	-	-
2006	3.09	2.27	0.73	0.81	0.26	0.02	0.01
2007	3.18	2.27	0.71	0.81	0.26	0.10	0.03
2008	3.24	2.15	0.66	0.87	0.27	0.22	0.07
2009	3.34	2.14	0.64	0.84	0.25	0.36	0.11
2010	3.51	2.15	0.61	0.84	0.24	0.53	0.15
2011	4.15	2.58	0.62	0.95	0.23	0.62	0.15
2012	3.94	2.32	0.59	0.90	0.23	0.72	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`
* Based on year of foundation
(1) The share of year-end expenditures in the Consolidated Central Budget.
(2) Figures show the composition of public funding allocated to universities grouped according their foundation years. The rows add to 100 %.

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, which is not reported as grants from

central government to local authorities.[15] Table 2 displays changes in the budget share of total expenditure of public universities in the consolidated budget. It shows that each wave of expansion has changed the composition of public expenditure devoted to universities. The share of universities in the central government budget has stayed at a level around 3-4% (Table 2, column 1), which is fairly stable despite the expansion of capacity with new universities. Table 2 provides evidence that public funds were reallocated in favor of new universities in each wave. Column 2 in Table 2 shows the composition of the year-end budget allocated to universities according to our periodization of expansion. 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 the JDP rule.

[15] Local authorities are not entitled to finance major development projects through their own budgets without the approval of the central government.

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
Balıkesir-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-Kahramanmaras-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
Nevsehir-Aksaray-Niğde-Kırıkkale-Kırsehir	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-Gümüshane	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 accesed on june 2015, https://istatistik.yok.gov.tr/ *** Calculated using TurkStat Household Labor Surveys (2004-2013)
Source: TurkStat Regional Statistics

Table 4: Higher Education Credit and Hostels Institution Statistics

	Public Student Dormitories (No. Of Beds)			Number of Students accessing various public scholarships			Total Amount of various scholarships (Thousand Turkish Liras)		
Years	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, Public university tuition fees are abolished for all students.

In addition to budget allocation, we need to give the scale of expansion at regional level. 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).[16] Although the situation in terms of regional share in enrollment is less visible, peripheral provinces have undoubtedly benefited from the expansion of higher education. Ankara, the capital province, and Istanbul lost around 3 percentage points 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 expansion wave that started in 2006. Lastly, Table 3 shows that distance education also has become important, particularly since 2008, reaching almost equal weight with traditional education. Comparing Tables 2 and 3, we can argue that despite the relative increase of funding for new universities, the government seems to have increased the burden of existing universities in terms of the number of students enrolled.[17]

The 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 been improved, particularly since 2010, with the involvement of the Housing Development Administration (TOKI), which officially undertakes public housing investments. .[18]

Table 4 displays the public policies facilitating local accommodation for students from

[16]Note that there was no significant supply pressure from secondary level graduates that would have stressed access to higher education during this period.

[17]For example, total number of enrolled students in Istanbul has increased from 143,095 in 2006 to 210,867 in 210,867.

[18]Law no. 6082 dated 25.11.2010. http://www.resmigazete.gov.tr/eskiler/2010/12/20101210-1.html

Table 5: Enrolled College Students* as % of Working Population** (NUTS2 regions)

	Ratio of Enrolled Students*** (% of population 15-65)					
	2004	2006	2009	2010	2011	2012
Istanbul	1.8	1.7	1.8	1.9	2.1	2.3
Edirne-Tekirdağ-Kırklareli	3.3	3.4	4.4	4.9	5.5	6.0
Balıkesir-Çanakkale	3.7	4.4	5.1	5.6	6.2	6.7
Izmir	3.0	3.1	3.3	3.4	3.7	3.9
Denizli-Aydın-Muğla	2.8	3.5	4.2	4.2	4.5	4.9
Manisa-Afyon-Kütahya-Usak	3.2	4	5.2	5.4	6.0	6.7
Bursa, Eskişehir, Bilecik (Open University)	3.6	3.5	3.5	3.7	4.1	4.2
Kocaeli-Sakarya-Düzce-Bolu-Yalova	4.7	5.7	6	6.1	6.5	6.9
Ankara	4.4	4.2	4.3	4.4	4.7	4.9
Konya-Karaman	4.5	5.3	5.4	5.3	5.6	6.0
Antalya-Isparta-Burdur	3.4	4.0	4.6	4.9	5.5	6.0
Adana-Mersin	2.1	2.2	2.5	2.5	2.8	3.0
Hatay-Kahramanmaras-Osmaniye	1.7	1.8	2.4	2.5	2.8	3.0
Nevsehir-Aksaray-Niğde-Kırıkkale-Kırsehir	4.3	4.5	5.4	6.0	7.2	7.9
Kayseri-Sivas-Yozgat	3.3	3.7	4.4	4.8	5.4	6.0
Zonguldak-Karabük-Bartın	2.6	2.9	3.7	4.3	5.5	6.8
Kastamonu-Çankırı-Sinop	2.9	2.9	3.3	3.8	4.6	5.4
Samsun-Tokat-Çorum-Amasya	2.2	2.5	3.2	3.5	4.0	4.5
Trabzon-Ordu-Giresun-Rize-Artvin-Gümüshane	3.0	3.4	4.6	5.1	5.9	6.6
Erzurum-Erzincan-Bayburt	5.5	5.6	7.1	8.4	10.1	11.5
Kars-Ağrı-Iğdır-Ardahan	1.7	2.4	2.9	3.2	3.4	4.1
Malatya-Elazığ-Bingöl-Tunceli	3.5	3.6	4.1	4.7	5.4	6.3
Van-Mus-Bitlis-Hakkari	1.4	1.7	2.1	2.4	2.6	2.9
Gaziantep-Adıyaman-Kilis	1.1	1.4	2.2	2.5	2.9	3.1
Diyarbakır-Sanlıurfa	1.4	1.4	1.7	1.8	2.0	2.2
Siirt-Mardin-Batman-Sırnak	0.6	0.6	0.9	1.1	1.3	1.5

* Source: TurkStat Regional Statistics last accessed on July 6 2016,
(http://tuikapp.tuik.gov.tr/Bolgesel/anaSayfa.do).
** Source: TurkStat Household Labor Surveys (2004-2012). Population figures are calculated using factor weights.
*** The ratio is obtained by dividing the total number of enrolled students and population aged between 15-65.

other regions. Taken together, Tables 3 and 4 show a remarkable increase in female access to, and enrollment in new universities. Dormitory facilities are particularly important 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.[19] In 2013, university fees were abolished for all students. We should note that, without changing the selection mechanism, which favors students whose parents can afford better high school quality (Caner and Okten, 2013) and private tutoring (Berberoğlu and Tansel, 2014), increasing subsidies to the system can not guarantee equity of access to higher education.

It is also worth noting that the increased demand for housing facilities from students must have put pressure on rental prices, which benefited rentiers. Non-pecuniary externalities might include certain service 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 have 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 five years.

Increasing enrollment and investment in higher education can further contribute to 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. The fact that in some regions total enrollment has increased far more than the working population

[19]University fee waiver and grants are means-tested and based on parental income level.

reveals the contribution of demand created by this increased capacity. Among other factors that would affect regional growth rates, in eastern provinces, we note that demand externalities can contribute to economic activity through service sector growth.

Although 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 the re-distributive effect of subsidizing higher education is very limited. For Turkey, Caner and Okten (2013) , using special data from the central entrance exam of 2002, showed that socio-economic background (parental income and education) is an important factor in predicting student success. They conclude that subsidizing post-secondary education (through a low public fee policy) mostly benefits students from higher income and better educated families. Contrary to other countries with similar central entrance exams and dual (public and private) university systems (Rozada and Menendez, 2002; Liu et al., 2006), Caner and Okten (2013) find that students from higher income families in Turkey have a higher probability of enrolling in private universities.[20] It is probable that these higher returns from post-secondary education constitute a strong incentive for families. We have to note that enhanced access, accommodation and grants specific to post-secondary education challenge existing social networks through public provision.[21] We should also 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.

3 Proximity Effect and College Access

Expansion in higher education and increased university accommodation and grants facilities are expected to increase mobility in terms of access. We can identify two channels that are likely to affect the outcome of the expansion. The cost effect of access, which operates through income is important in terms of inequality, particularly for students with poor family backgrounds. Although the supply and capacity of higher education has increased during the expansion, the costs associated with residing away from home may be unaffordable for certain families. Thus, the income effect can modify college preferences, with proximity to a college being likely to increase enrollment of local students through this channel. For the US, Turley (2009) argues that college proximity facilitates the transition to college for families, both financially and emotionally. Turley (2009)'s findings also support the fact 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

[20] The importance of private tutoring can partly explain the income channel in student success, Berberoğlu and Tansel (2014).

[21] For India, Iyer et al. (2014) argue that insurance provided by religious networks extends to non-religious service provision, and these services, which mostly cover education and health, compensate for poor public provision. Similarly, Hungerman (2005) finds a crowding-out effect for the state welfare provision program on church-funded services in the US. We can argue that in Turkey, political welfare redistribution, which is becoming more universal (e.g. in health and education), will inevitably crowd out private provision. An example of crowding-out can be the increased capacity of dormitory facilities, which will increase public provision.

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) argue that attitudinal familism (a strong sense of attachment to family members) can be a motive besides socio-economic factors. As already discussed, female college enrollment increased dramatically in Turkey during the 2006 expansion (Table 3). We can argue that proximity is likely to affect the increased share of female students through channels that are hard to identify with 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 or networks. If we assume that, in the 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 understand how higher education expansion has affected the access of local students at the regional level, we use data from yearly cross-sections of the Household Labor Force Surveys (HLFS) between 2002-2013, which give detailed information at the NUTS2 level. We specifically focus on whether students of poorer local families have benefited from college proximity at the regional level during the transition from high school to college. We construct a probit model in which the year dummy (pre-expansion and post-expansion) captures the effect of college proximity, while paternal education level will proxy for the income effect. Specifically, 2004 or 2005 are taken as the pre-expansion period while 2012 or 2013 are taken as the post-expansion years.[22] We take lower-than-secondary education level as a proxy for family income. Equ. 1 gives the specification:

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

where ϕ is the cumulative distribution. The dependent variable $PS_{i,r,t}$ 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 nearby. 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 education level. Coefficients β_1 and β_2 indicate paternal education and year effects. We ran separate regressions for each NUTS1 regions. In each estimation, we were interested in the sign of the coefficient β_3 which will capture the interaction between the effect of paternal education and the year effect.

Table 6 displays the results of the probit estimation. The model incorporates two main effects (income and year) while the interaction term captures the post-expansion effect on family income (paternal education). The results show that coefficients β_1 and β_2 are mostly positive and significant across regions. However, we observe no significant and negative impact of the interaction term for the male sample, which implies that proximity has no impact

[22]The choice of treatment year mostly does not change the sign of the effects. The regression tables with different years are available upon request.

on the attendance of students whose father has a less-than-secondary education level. For the female sample, in the Eastern Black Sea, and the Northeastern and Southeastern Anatolian regions, the coefficient of the interaction term was negative and significant, which indicates that, relative to 2004, daughters whose father's education was less than secondary level are more likely to attend a local college nearby. These results support 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 some conservative regions. We call this effect *localization* with respect to post-secondary education. We should note that the model is simple and bears some biases so it requires improvement. One shortcoming concerns missing observations since family members residing elsewhere are not counted in the surveys which are address based. Consequently, children who are enrolled in a distant college were excluded from the sample. As long as these observations are missing in both periods, we can assume that the difference-in-difference structure of the model can minimize this bias. The second bias concerns the use of paternal education level as a proxy for income effect.

Localization might also reflect compositional change, meaning that the share of less-educated parents decreases relative to others at that region. Therefore, as a robustness check, we focus on the year effect, taking the entire population as the sample. We estimate a modified version of Equ. 1 above by constructing the difference-in-difference structure based on two main variables: year and region effect. In this model, the interaction term captures the impact of the expansion for 26 NUTS2 regions. Table 7, which summarizes in which regions *localization* is more effective, shows that the proximity effect is not only limited to girls in poorer NUTS2 regions (19, 20, 21, 22 and 25), and that local male students have also benefited from this availability. The regional classification roughly corresponds to NUTS1 regions in our previous estimation.

Table 6: Students attending post-secondary studies and residing with their parents (separate NUTS1 regions)

NUTS1	Istanbul (1)	West Marmara (2)	Aegean (3)	East Marmara (4)	West Anatolia (5)	Mediterranean (6)	Central Anatolia (7)	West Black Sea (8)	East Black Sea (9)	Northeast Anatolia (10)	Middle East Anatolia (11)	Southeast Anatolia (12)
						Girls						
Father secondary education or above	0.738***	0.444**	0.665***	0.484***	0.976***	0.612***	0.313*	0.071	0.723***	1.133***	0.303	0.771***
	(0.091)	(0.196)	(0.099)	(0.113)	(0.109)	(0.121)	(0.164)	(0.153)	(0.179)	(0.212)	(0.192)	(0.187)
Year 2012	0.520***	0.567***	0.413***	0.308***	0.552***	0.628***	0.460***	0.342***	0.926***	1.157***	0.763***	0.881***
	(0.082)	(0.159)	(0.086)	(0.097)	(0.097)	(0.100)	(0.143)	(0.133)	(0.153)	(0.178)	(0.163)	(0.145)
Year 2012 * Father education	0.395***	0.380	0.218	-0.063	-0.026	-0.080	0.144	0.408*	-0.417*	-0.450*	-0.298	-0.414*
	(0.152)	(0.279)	(0.151)	(0.170)	(0.145)	(0.169)	(0.225)	(0.232)	(0.232)	(0.262)	(0.272)	(0.236)
Constant	-0.730***	-1.204***	-0.860***	-0.791***	-1.001***	-1.222***	-0.988***	-1.147***	-1.338***	-1.492***	-1.198***	-1.536***
	(0.056)	(0.125)	(0.056)	(0.066)	(0.075)	(0.075)	(0.107)	(0.079)	(0.122)	(0.151)	(0.132)	(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
						Boys						
Father secondary education or above	0.660***	0.636***	0.636***	0.642***	0.804***	0.586***	0.405**	0.219*	0.575***	0.515***	0.456***	0.186
	(0.085)	(0.158)	(0.092)	(0.094)	(0.101)	(0.102)	(0.161)	(0.124)	(0.177)	(0.171)	(0.143)	(0.146)
Year 2012	0.227***	0.341***	0.379***	0.036	0.416***	0.200**	0.596***	0.219**	0.620***	0.583***	0.401***	0.300***
	(0.074)	(0.121)	(0.076)	(0.081)	(0.081)	(0.081)	(0.111)	(0.105)	(0.129)	(0.120)	(0.122)	(0.097)
Year 2012 * Father education	0.247*	-0.318	0.061	0.069	-0.074	0.007	-0.043	0.376**	0.279	0.267	0.140	0.378*
	(0.132)	(0.216)	(0.139)	(0.145)	(0.132)	(0.150)	(0.209)	(0.185)	(0.222)	(0.224)	(0.215)	(0.206)
Constant	-0.568***	-0.978***	-0.933***	-0.766***	-1.027***	-1.040***	-1.167***	-1.081***	-1.379***	-1.154***	-1.177***	-1.193***
	(0.047)	(0.093)	(0.050)	(0.051)	(0.061)	(0.058)	(0.083)	(0.060)	(0.102)	(0.092)	(0.080)	(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<0.01, ** p<0.05, * p<0.1
Source: Household Labor Surveys (2004, 2012) according to regional NUTS1 level. Estimations include children aged between 18 and 25.

Table 7: Students attending post-secondary studies and residing with their parents (NUTS2 regions)

	Girl					Boy				
	2004 vs 2012	2005 vs 2012	2004 vs 2013	2005 vs 2013	2004-05 vs 2012-13	2004 vs 2012	2005 vs 2012	2004 vs 2013	2005 vs 2013	2004-05 vs 2012-13
Year Effect	0.552***	0.521***	0.747***	0.716***	0.631***	0.326***	0.425***	0.395***	0.494***	0.409***
	(0.066)	(0.066)	(0.067)	(0.067)	(0.047)	(0.060)	(0.060)	(0.060)	(0.060)	(0.042)
Year x Nuts2 (Edirne-Tekirdağ-Kırklareli)	0.048	0.161	-0.049	0.064	0.052	-0.195	-0.305***	-0.265***	-0.374***	-0.284***
	(0.210)	(0.220)	(0.218)	(0.227)	(0.154)	(0.154)	(0.156)	(0.159)	(0.161)	(0.111)
Year x Nuts3 (Balıkesir-Çanakkale)	0.015	0.165	-0.143	0.007	0.011	-0.045	0.278***	-0.059	0.264	0.090
	(0.179)	(0.185)	(0.177)	(0.183)	(0.128)	(0.152)	(0.165)	(0.155)	(0.168)	(0.112)
Year x Nuts4 (Izmir)	-0.034	0.034	-0.134	-0.067	-0.049	0.042	0.170	0.034	0.162	0.108
	(0.117)	(0.117)	(0.120)	(0.119)	(0.084)	(0.110)	(0.109)	(0.111)	(0.110)	(0.077)
Year x Nuts5 (Denizli-Aydın-Muğla)	-0.406***	-0.270	-0.313***	-0.178	-0.297***	0.256	0.034	0.170	-0.052	0.095
	(0.175)	(0.181)	(0.176)	(0.182)	(0.126)	(0.161)	(0.153)	(0.158)	(0.150)	(0.109)
Year x Nuts6 (Manisa-Afyon-Kütahya-Usak)	0.066	0.299***	-0.262***	-0.029	0.014	-0.151	-0.250***	-0.170	-0.269***	-0.210***
	(0.148)	(0.154)	(0.156)	(0.162)	(0.109)	(0.126)	(0.127)	(0.127)	(0.127)	(0.090)
Year x Nuts7 (Bursa, Eskişehir, Bilecik)	-0.386***	-0.432***	-0.491***	-0.536***	-0.462***	-0.213***	-0.300***	-0.265***	-0.352***	-0.283***
	(0.129)	(0.127)	(0.132)	(0.130)	(0.092)	(0.115)	(0.113)	(0.119)	(0.117)	(0.082)
Year x Nuts8 (Kocaeli-Sakarya-Düzce-Bolu-Yalova)	-0.123	0.026	-0.271***	-0.122	-0.122	-0.206***	-0.243***	-0.156	-0.193***	-0.203***
	(0.131)	(0.134)	(0.127)	(0.130)	(0.092)	(0.109)	(0.111)	(0.111)	(0.113)	(0.078)
Year x Nuts9 (Ankara)	0.006	-0.025	-0.106	-0.137	-0.060	0.088	-0.173***	0.214***	-0.047	0.020
	(0.108)	(0.108)	(0.107)	(0.108)	(0.076)	(0.099)	(0.099)	(0.100)	(0.100)	(0.070)
Year x Nuts10 (Konya-Karaman)	-0.048	0.394***	-0.157	0.285***	0.104	0.134	0.321***	0.305***	0.492***	0.288***
	(0.137)	(0.148)	(0.136)	(0.148)	(0.099)	(0.117)	(0.131)	(0.117)	(0.131)	(0.087)
Year x Nuts11 (Antalya-Isparta-Burdur)	-0.046	0.043	-0.141	-0.052	-0.046	-0.607***	-0.654***	-0.110	-0.158	-0.343***
	(0.168)	(0.173)	(0.164)	(0.170)	(0.119)	(0.154)	(0.159)	(0.139)	(0.144)	(0.103)
Year x Nuts12 (Adana-Mersin)	0.174	0.269***	-0.136	-0.041	0.074	0.038	0.173	0.159	0.294***	0.164***
	(0.137)	(0.136)	(0.141)	(0.139)	(0.098)	(0.117)	(0.118)	(0.119)	(0.120)	(0.084)
Year x Nuts13 (Hatay-Kahramanmaras-Osmaniye)	-0.089	0.170	-0.414***	-0.155	-0.118	-0.060	0.290***	-0.054	0.297***	0.086
	(0.166)	(0.174)	(0.179)	(0.186)	(0.124)	(0.139)	(0.154)	(0.145)	(0.159)	(0.104)
Year x Nuts14 (Nevsehir-Aksaray-Niğde-Kırıkkale-Kırsehir)	-0.083	0.169	-0.122	0.130	0.008	0.307***	0.313***	0.365***	0.371***	0.330***
	(0.167)	(0.183)	(0.169)	(0.185)	(0.123)	(0.146)	(0.152)	(0.151)	(0.156)	(0.107)
Year x Nuts15 (Kayseri-Sivas-Yozgat)	0.025	0.155	-0.189	-0.059	-0.009	0.242***	0.122	0.257***	0.136	0.187***
	(0.171)	(0.164)	(0.168)	(0.161)	(0.117)	(0.146)	(0.143)	(0.148)	(0.145)	(0.103)
Year x Nuts16 (Zonguldak-Karabük-Bartın)	-0.060	-0.035	-0.477***	-0.452***	-0.245	0.167	0.393***	0.021	0.247	0.196
	(0.239)	(0.237)	(0.254)	(0.252)	(0.173)	(0.179)	(0.188)	(0.197)	(0.206)	(0.135)
Year x Nuts17 (Kastamonu-Çankırı-Sinop)	0.080	-0.070	0.137	-0.013	0.038	0.072	-0.080	-0.004	-0.155	-0.040
	(0.215)	(0.211)	(0.210)	(0.205)	(0.148)	(0.167)	(0.169)	(0.180)	(0.182)	(0.123)
Year x Nuts18 (Samsun-Tokat-Çorum-Amasya)	-0.123	-0.146	-0.006	-0.029	-0.059	0.027	-0.129	-0.123	-0.279***	-0.124
	(0.166)	(0.163)	(0.157)	(0.154)	(0.112)	(0.139)	(0.139)	(0.143)	(0.143)	(0.100)
Year x Nuts19 (Trabzon-Ordu-Giresun-Rize-Artvin-Gümüshane)	0.191	0.394***	-0.093	0.109	0.144	0.408***	-0.053	0.546***	0.086	0.239***
	(0.130)	(0.138)	(0.130)	(0.138)	(0.094)	(0.119)	(0.117)	(0.122)	(0.120)	(0.084)
Year x Nuts20 (Erzurum-Erzincan-Bayburt)	0.271	0.588***	0.071	0.388***	0.327***	0.262***	0.336***	0.233***	0.306***	0.281***
	(0.170)	(0.177)	(0.174)	(0.180)	(0.124)	(0.139)	(0.143)	(0.140)	(0.144)	(0.100)
Year x Nuts21 (Kars-Ağrı-Iğdır-Ardahan)	0.399***	0.510***	0.258	0.369	0.382***	0.296	0.136	0.407***	0.248	0.268***
	(0.213)	(0.222)	(0.222)	(0.230)	(0.156)	(0.184)	(0.184)	(0.187)	(0.187)	(0.131)
Year x Nuts22 (Malatya-Elazığ-Bingöl-Tunceli)	0.300***	0.303***	0.244	0.247	0.280***	0.286***	0.157	0.248***	0.120	0.205***
	(0.170)	(0.171)	(0.167)	(0.168)	(0.120)	(0.145)	(0.147)	(0.142)	(0.144)	(0.102)
Year x Nuts23 (Van-Mus-Bitlis-Hakkari)	-0.299	-0.276	-0.499***	-0.475***	-0.385***	-0.123	-0.436***	-0.043	-0.356***	-0.225***
	(0.227)	(0.223)	(0.235)	(0.231)	(0.161)	(0.166)	(0.168)	(0.157)	(0.160)	(0.115)
Year x Nuts24 (Gaziantep-Adıyaman-Kilis)	0.042	0.063	-0.111	-0.090	-0.021	-0.070	0.015	0.198	0.282***	0.093
	(0.191)	(0.183)	(0.188)	(0.180)	(0.131)	(0.160)	(0.168)	(0.161)	(0.169)	(0.115)
Year x Nuts25 (Diyarbakır-Sanlıurfa)	0.593***	0.438***	0.297	0.142	0.362***	0.185	0.024	-0.007	-0.168	0.010
	(0.199)	(0.177)	(0.207)	(0.186)	(0.134)	(0.142)	(0.140)	(0.145)	(0.142)	(0.100)
Year x Nuts26 (Siirt-Mardin-Batman-Sırnak)	-0.486***	-0.078	-0.209	0.200	-0.098	0.001	0.354***	-0.044	0.309	0.166
	(0.233)	(0.222)	(0.224)	(0.213)	(0.155)	(0.187)	(0.192)	(0.196)	(0.200)	(0.136)
Constant	-0.458***	-0.428***	-0.458***	-0.428***	-0.443***	-0.367***	-0.465***	-0.367***	-0.465***	-0.416***
	(0.043)	(0.043)	(0.043)	(0.043)	(0.031)	(0.039)	(0.039)	(0.039)	(0.039)	(0.027)
Observations	11,257	11,284	11,139	11,166	22,423	15,837	15,767	15,239	15,169	31,006
Pseudo R-squared	0.0773	0.0773	0.0773	0.0773	0.0773	0.0533	0.0533	0.0533	0.0533	0.0533

Year dummies indicate post-expansion period namely year 2012 or year 2013 or pooled sample of years 2012 and 2013.
Coefficients of the interaction term between Year and NUTS2 regions are reported here because of space limitations. Full regressions are available upon request.
Robust standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1
Source: Household Labor Surveys (2004, 2005, 2012 and 2013) according to regional NUTS2 level. Estimations include children aged between 18 and 25.

In the light of studies evaluating the social externalities of university graduates (for the US, Moretti (2004) and for Turkey, Bakis et al. (2013)), we can speculate that this trend is likely change economic dynamics within regions. Regional selection can also produce structural effects on post-secondary education mobilization. Localization might 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, given the low quality Erdoğmuş and Esen (2016) and time needed to adapt, it is unlikely that these emerging universities will sufficiently meet the conditions to develop a critical mass and boost the local dynamics of the economy in the near future.

Generally, demand externalities may significantly affect individual regions suffering from low levels of economic activity. 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 (Table 5). 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 such as real estate and housing, local dynamics have contributed to local economies throughout the 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. US-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) provide evidence for skilled-biased technical change that favors the compensation of more highly educated workers. Barth and Lucifora (2006) find 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), Bakis (2015) and Filiztekin (2015), discuss the importance of wage income in the structural transition to paid or market labor in Turkey. This net transition accounts for more than 10% of the labor force during the last decade. Most of these workers are wage earners who have moved from locally defined jobs such as self-employment or small scale family business to market ones. This observation gains support from the fact that the previously locally defined network structure of cities has experienced a structural change to become more complex, more integrated and less communitarian. 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 affecting 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 there is a tendency for local marginal returns to higher education 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 the simple Mincerian wage regression described in Equ. 2

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

The sample for real hourly wage regressions is restricted to male wage earners aged 24-39 to gain a sufficient number of observations and avoid 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.[23] Table 8 summarizes the regression results given in Equ. 2 for each region for pooled cross-sections of 2004-2005 and 2012-2013 data.

[23]Salehi-Isfahani et al. (2009) argues that individual returns to years of education show non-linearities for Turkey

Table 8: Regional Returns to Education (Men aged 24-39)

NUTS1	Istanbul (1)	West Marmara (2)	Aegean (3)	East Marmara (4)	West Anatolia (5)	Mediterranean (6)	Central Anatolia (7)	West Black Sea (8)	East Black Sea (9)	Northeast Anatolia (10)	Middle East Anatolia (11)	Southeast Anatolia (12)
						2004-05						
Primary	0.059***	0.121***	0.126***	0.069***	0.125***	0.151***	0.125***	0.059***	0.047	0.234***	0.056*	0.134***
	(0.019)	(0.030)	(0.015)	(0.015)	(0.021)	(0.020)	(0.027)	(0.020)	(0.034)	(0.038)	(0.029)	(0.023)
Secondary	0.291***	0.368***	0.296***	0.320***	0.392***	0.402***	0.267***	0.213***	0.270***	0.342***	0.342***	0.328***
	(0.013)	(0.027)	(0.014)	(0.014)	(0.022)	(0.020)	(0.027)	(0.020)	(0.032)	(0.034)	(0.025)	(0.020)
Post-secondary	0.995***	0.741***	0.738***	0.686***	0.851***	0.894***	0.745***	0.555***	0.637***	0.784***	0.752***	0.796***
	(0.023)	(0.039)	(0.022)	(0.027)	(0.033)	(0.031)	(0.040)	(0.030)	(0.046)	(0.049)	(0.038)	(0.032)
Tenure	0.024***	0.043***	0.033***	0.056***	0.025***	0.034***	0.047***	0.043***	0.041***	0.035***	0.026***	0.023***
	(0.003)	(0.006)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.004)	(0.007)	(0.007)	(0.005)	(0.004)
Tenure Sq.	-0.058***	-0.161***	-0.136***	-0.186***	-0.095***	-0.122***	-0.174***	-0.149***	-0.185***	-0.101***	-0.071***	-0.074***
	(0.016)	(0.033)	(0.014)	(0.017)	(0.020)	(0.023)	(0.027)	(0.019)	(0.040)	(0.030)	(0.026)	(0.019)
Potential Exp.	0.059***	0.016*	0.021***	0.021***	0.041***	0.031***	0.029***	0.029***	0.023**	0.015	0.024**	0.017**
	(0.006)	(0.009)	(0.005)	(0.006)	(0.010)	(0.007)	(0.009)	(0.008)	(0.010)	(0.011)	(0.010)	(0.007)
Potential Exp. Squ.	-0.154***	-0.024	-0.038**	-0.047**	-0.081***	-0.061***	-0.070**	-0.071***	-0.041	-0.012	-0.046	-0.032
	(0.017)	(0.030)	(0.017)	(0.018)	(0.030)	(0.023)	(0.028)	(0.024)	(0.033)	(0.034)	(0.030)	(0.021)
Public Employee	0.155***	0.479***	0.474***	0.335***	0.530***	0.608***	0.608***	0.794***	0.731***	0.812***	0.690***	0.758***
	(0.022)	(0.025)	(0.014)	(0.016)	(0.020)	(0.019)	(0.026)	(0.019)	(0.031)	(0.030)	(0.024)	(0.020)
Constant	0.791***	0.781***	0.748***	0.879***	0.553***	0.510***	0.575***	0.529***	0.629***	0.384***	0.630***	0.561***
	(0.043)	(0.073)	(0.044)	(0.047)	(0.077)	(0.059)	(0.071)	(0.061)	(0.079)	(0.081)	(0.078)	(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
						2012-13						
Primary	0.091***	0.058***	0.064***	0.075***	0.078***	0.073***	0.059***	0.076***	0.021	-0.047*	0.048**	0.073***
	(0.011)	(0.018)	(0.012)	(0.013)	(0.013)	(0.016)	(0.019)	(0.022)	(0.026)	(0.027)	(0.023)	(0.019)
Secondary	0.304***	0.218***	0.234***	0.252***	0.250***	0.227***	0.162***	0.183***	0.109***	0.132***	0.143***	0.234***
	(0.011)	(0.018)	(0.012)	(0.013)	(0.012)	(0.015)	(0.018)	(0.018)	(0.024)	(0.025)	(0.022)	(0.020)
Post-secondary	1.010***	0.596***	0.700***	0.743***	0.796***	0.702***	0.594***	0.568***	0.558***	0.617***	0.716***	0.883***
	(0.019)	(0.026)	(0.021)	(0.021)	(0.019)	(0.023)	(0.027)	(0.026)	(0.036)	(0.037)	(0.033)	(0.029)
Tenure	0.021***	0.024***	0.025***	0.029***	0.023***	0.022***	0.019***	0.014***	0.019***	0.007	0.012***	0.033***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.004)	(0.004)
Tenure Sq.	-0.070***	-0.071***	-0.089***	-0.087***	-0.108***	-0.079***	-0.056***	-0.028	-0.052**	0.001	-0.038	-0.146***
	(0.016)	(0.018)	(0.015)	(0.017)	(0.018)	(0.018)	(0.020)	(0.019)	(0.026)	(0.028)	(0.024)	(0.024)
Potential Exp.	0.062***	0.035***	0.045***	0.050***	0.046***	0.050***	0.037***	0.036***	0.037***	0.032***	0.029***	0.043***
	(0.005)	(0.006)	(0.005)	(0.005)	(0.004)	(0.005)	(0.006)	(0.006)	(0.008)	(0.008)	(0.007)	(0.007)
Potential Exp. Squ.	-0.146***	-0.087***	-0.111***	-0.119***	-0.112***	-0.121***	-0.101***	-0.084***	-0.099***	-0.094***	-0.088***	-0.107***
	(0.014)	(0.018)	(0.014)	(0.015)	(0.014)	(0.017)	(0.019)	(0.019)	(0.027)	(0.026)	(0.023)	(0.021)
Public Employee	0.305***	0.642***	0.569***	0.425***	0.569***	0.608***	0.716***	0.733***	0.692***	0.677***	0.624***	0.532***
	(0.016)	(0.018)	(0.016)	(0.017)	(0.014)	(0.018)	(0.020)	(0.018)	(0.025)	(0.027)	(0.023)	(0.021)
Constant	0.941***	1.053***	0.944***	1.002***	0.983***	0.875***	1.046***	0.997***	1.032***	1.096***	1.056***	0.774***
	(0.038)	(0.045)	(0.038)	(0.038)	(0.036)	(0.043)	(0.048)	(0.047)	(0.067)	(0.063)	(0.058)	(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
Marginal Returns to Post-secondary Education												
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. The 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 8 show marginal returns to post-secondary education with respect to secondary[24] and primary education level. Compared to the 2004-05 pooled regressions, marginal returns to post-secondary relative to secondary education have increased in regions where higher education has expanded, particularly in eastern provinces, although this does not hold for primary education level for all regions. [25] For 1988, 1994 and 2003, Salehi-Isfahani et al. (2009) show that marginal returns to graduating from post-secondary level with respect to secondary level increased. They argue that the increasing trend of marginal returns despite the expansion of education is related more with labor demand conditions and the sophistication of the economic structure, since a similar expansion in Iran did not result in increased individual returns.[26] Higher returns to college might reflect technological changes which favor skilled labor. Bakis and Polat (2015) also argue that it is rather structural change which implies that between effects are larger across industries. Whatever the reason behind the higher relative marginal returns, increased labor demand coupled with economic growth stimulate attendance in higher education in Turkey's eastern regions. Another interesting result is the public-private differential (Table 8), whereby public employees earn more than private ones but still the premium increases in less-developed regions. This implies that amenity differentials are compensated for in the public sector. The fact that Istanbul has the highest marginal returns to post-secondary education supports the claim that highly educated workers sort into more developed regions, namely Istanbul , Turkey's largest city. Related to our previous remarks 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 the expansion of education at every level increases female labor force participation for younger cohorts (Tansel (2001), (Dayıoğlu and Kırdar, 2010)). For higher education, this upward trend in female participation needs to be coupled with an expansion of public sector jobs where gender selection is more likely. From a political economy perspective, 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 healthcare in order to increase labor participation rates.[27] 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.

[24]Regular and vocational high schools are merged into one category in order to avoid confusion.

[25]Returns to secondary education level with respect to primary education level shows a relative decline in most regions. This closing gap in returns needs further investigation.

[26]Salehi-Isfahani et al. (2009) find 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) report a decline in returns to education for 2002 compared to 1994, which they attributed to insufficient labor demand due to the 2001 crisis.

[27]Bakis et al. (2013) report that increasing the college share of employment in regions promotes social returns to education, particularly for women.

5 Conclusion

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 Turkey's poorer eastern regions. This expansion, which has almost doubled enrollment rates since 2004, has been accompanied by subsidy policies facilitating more education grants and fee waivers, and heavy investment in public student accommodation. In terms of regional development, the 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. Besides these macro effects, this study highlights several impacts of this expansion on labor market dynamics. First, our results show that access to higher education increased in eastern and less-developed regions. Second, comparing the periods before and after expansion, we find that college access has increased with college proximity (localization effect) and this expansion led to a re-distributive effect in favor girls with low paternal education backgrounds. In this respect, it seems that new universities are helping to build human capital at the regional level in Turkey. Another important finding of our study is the change in the structure of local wage earnings related to the expansion. Despite the increase in the supply of college graduates at the regional level, the local marginal returns to higher education have not decreased. Compared to the pre-expansion period, wage regressions show that there is a slow convergence in terms of marginal returns to higher education for the male sample. These findings imply that we need further study and more data to better understand the impact of this expansion.

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