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Teacher Allocation Policies and the Unbalanced Distribution of Novice and Senior Teachers across Regions in Turkey

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Abstract: Policies toward fostering a more balanced distribution of teacher quality have garnered considerable attention from researchers and policymakers around the world. This attention has been motivated largely by the widely acknowledged educational goal of providing quality education for all children. Equipped with similar policy concerns, this study examines the initial assignment of novice teachers and voluntary transfer of senior teachers to determine whether there is any kind of sorting pattern in the allocation of novice and experienced teachers to schools across regions, particularly across provinces, in Turkey. Using the entire initial teacher assignment and voluntary teacher transfer data in between 2010 to 2014, the descriptive and correlational analyses in this study provide clear evidence that both novice and senior teachers are unevenly allocated across regions. The findings suggest that already-disadvantaged students in the less-developed eastern regions of the country are far more likely to be exposed to novice and/or less-experienced teachers. Possible explanations of this observed teacher sorting pattern and its policy implications are discussed.

Keywords: Teacher employment, teacher allocation, teacher quality, educational inequalities, Turkey

Introduction

As an emerging economy, Turkey has been struggling with the long-standing issue of unbalanced economic development between eastern and western regions of the country (Simay Karaalp, 2014). The development gap between regions has translated into systematic regional disparities in access to and quality of critical public services. Education is among these public services—perhaps the most important one—distributed unevenly across regions, provinces, and sub-provinces in Turkey. Despite decades of intense policy efforts, including extensive economic and educational reforms and a considerable increase in educational investments, regional disparities continue to exist, both in access to educational opportunities and in the distribution of educational outcomes and resources (World Bank, 2005).

Educational policymakers in Turkey have been concerned particularly with the persistent achievement gaps between regions. Empirical studies that use student performance data from both international assessments (such as TIMMS and PISA) and/or national tests (such as the secondary school selection and university entrance exams) have consistently revealed that students in the least-developed eastern and southeastern regions have scored significantly lower than their counterparts in other regions (Alacacı and Erbaş, 2010; Berberoğlu and Kalender, 2005; Gümüş and Atalmis, 2012). Not surprisingly, scholarly attempts to explain and policy efforts to narrow the existent regional gaps in student

performance have often directed their attention to regional discrepancies in the distribution of educational resources.

The present study focuses on an important resource-related issue that potentially contributes to existing regional achievement gaps: unequal distribution of teachers across regions. While regional imbalances in teacher quality have received too much attention from scholars and policymakers in Turkey, empirical evidence on this issue is very scarce and underdeveloped (Özoğlu, 2015). Given the growing body of educational research that has linked teacher quality with student outcomes (Darling-Hammond, 2010), this issue certainly deserves more empirical investigation. This paper is motivated by this gap and aims to identify whether, and to what extent, there is a sorting pattern in the allocation of novice and experienced teachers to schools across regions, particularly across provinces, in Turkey.

Based on an extensive data set of initial assignments (of novice teachers) and voluntary transfers (of senior) that took place between 2010 and 2014, the descriptive and correlational analyses in this study reveal that both novice and senior teachers are unevenly allocated across regions/provinces, both in terms of their quantity and quality. The results suggest that low-performing provinces in the underdeveloped eastern regions systematically receive more novice teachers and/or less-experienced senior teachers. This paper, based on empirical evidence, argues that the current teacher employment policies and practices in Turkey appear to be a major cause of this teacher sorting pattern that disfavors already-disadvantaged students in less-developed eastern regions.

The remainder of the paper is organized as follows. The following section reviews the current literature about the link between teacher quality and student outcomes. Then, the paper provides a brief discussion about teacher assignment and transfers policies in Turkey. The next section outlines the research questions and describes the data and methodological approaches. This section is followed by the presentation of empirical findings. The final section contains concluding remarks and discusses possible policy implications of the findings.

Teacher Quality and Student Outcomes

A growing body of educational research has been devoted to identifying the factors that contribute to student outcomes. The empirical evidence derived from these investigations suggests that student achievement is influenced by a range of complex and interacting factors functioning at different levels within an educational system. These include student-related factors such as their skills, aspirations, and motivations to engage in learning processes; family-related factors such as their educational attainments, economic/cultural resources, and attitudes; and school-related factors such as organizational structure, curricular design, and availability and/or quality of school resources, including curricular materials and teachers. Although the often-cited Coleman Report (Coleman et al., 1966) and several other subsequent investigations (i.e., Jencks et al., 1972; Peaker, 1971) downplay the role of school factors relative to out-of-school factors, particularly to family background characteristics, in explaining the differences in student outcomes, a persuasive body of more recent research suggests that school factors are also powerful predictors of student achievement (Clotfelter et al., 2005; 2006).

Empirical studies on school effectiveness highlight teacher quality as one of the most important in-school factors in student achievement (Hanushek et al., 2014). There are many investigations providing ample evidence that teacher quality greatly affects academic performance of students. For instance, based on their analyses of the data from the Tennessee Value-Added Assessment System in the United States, Sanders and Horn (1998) conclude

that student academic growth is influenced more by teacher quality than by other factors such as race, socioeconomic level, class size, and classroom heterogeneity. Moreover, using longitudinal panel data from two school districts in New Jersey, Rockoff (2004) estimates that a one-standard-deviation increase in teacher quality raises test scores in reading and math by approximately 0.1 standard deviations. Similar estimates are observed by various other empirical investigations conducted in different contexts (Aaronson et al., 2007; Rivkin et al., 2005).

An important conclusion derived from teacher effectiveness research is that while teacher quality is important for all students, effective teachers are particularly rewarding for low-achieving students (Rivkin et al., 2005). For instance, Sanders and Rivers (1996) find that highly effective teachers facilitate considerably important gains in student achievement for all students, but lower-achieving students are the first to benefit from increases in teacher effectiveness. Another important conclusion is that the effects of teachers on student attainment are both additive and cumulative, with weak evidence that the effects of ineffective teachers on student achievement can be offset by subsequent effective teachers (Sanders and Rivers, 1996). This implies that students facing several ineffective teachers in a row face overwhelming odds against success.

Although extant research on teacher effectiveness provides strong evidence that teacher quality is an important school factor in student achievement, the picture is less clear in regard to which teacher characteristics are associated with teacher quality (Goldhaber and Brewer, 1997). Empirical research linking student achievement to observable teacher characteristics often reveals inconsistent results (Aaronson et. al., 2007; Hanushek, 1997). However, two measurable teacher characteristics are often reported to be associated with student performance in a relatively stronger and consistent manner: subject knowledge (as usually measured by teacher licensure/recruitment tests) and experience. Numerous studies from different contexts have demonstrated a positive impact of teacher test scores on student performance (Clotfelter et. al., 2006; Metzler and Ludger, 2012; Piopiunik et al., 2014).

In terms of teacher experience, scholars often make a distinction between two sets of studies: studies that use simple linear measures of experience, which focus on years of teaching experience, and studies that use non-linear measures of experience, which focus particularly on inexperienced teachers (Clotfelter et al., 2005; Eide et al., 2004). Studies that use linear measures are often inconclusive. This is usually attributed to curvilinear interaction between teacher experience and student achievement; that is, the benefits of experience appear to level off after several years (Darling-Hammond, 2000). On the other hand, studies that focus on teachers with no or limited experience conclude that inexperienced teachers who have less than three years of experience are typically less effective than more experienced teachers (Clotfelter et al., 2006; Kane et al., 2008; Rivkin et al., 2005).

Evaluated together, these findings suggest that students exposed to inexperienced teachers and/or to teachers with lower licensure test scores (weaker subject knowledge) are at a disadvantage in terms of their likely academic achievements compared to other students. Of course, it is inevitable for any education system to welcome new teachers and/or to allow experienced teachers to transfer from one school to another. However, an important policy concern arises at this point: to what extent are teachers with little to no experience and also teachers with lower test scores disproportionately allocated to classrooms, schools, districts, or regions with higher proportions of disadvantaged students? This concern drives the main focus of the present study. It focuses specifically on the regional differences in the distribution of teacher quality, as measured by experience and teacher selection test scores. This specific focus reflects both the nature of the data utilized by the study and the fact that inequalities in educational resources and outcomes in Turkey are most apparent at the regional level.

Teacher Assignment and Transfer Policies in Turkey

Despite the extent of regional disparities apparent in both socioeconomic and educational indicators, the governance of the public education system in Turkey is highly centralized. Almost every aspect of the system is regulated by the central education authority, the Ministry of National Education (MONE). Teacher employment policies and practices are no exception. Teachers are allocated to schools centrally by MONE through either initial assignments of novice teachers or seniority-based transfers[1]. At first glance, one might consider that such a centrally regulated teacher employment system could produce an equitable distribution teacher quality across regions/provinces. However, as the findings of this study also reveal, several aspects of the system appear to collectively disfavor students in underdeveloped regions.

For instance, senior teachers seeking voluntary transfers are allocated to schools solely based on their school preferences and seniority score. The seniority score incorporates both the number of years teaching and the working conditions of the schools taught in, which is determined largely by the living and socioeconomic conditions of their locales. This means that for the same amount of time spent in teaching, teachers working in underdeveloped regions receive higher seniority score compared to their counterparts working in more-developed regions (Özoğlu, 2015). This practice is, for sure, intended to encourage both prospective and senior teachers to go to schools with lower socioeconomic (low-SES) context. However, given that teachers working at low-SES locations are more likely to gain higher seniority scores in a shorter time period and that teachers with higher seniority scores have greater choice over where they want to transfer, it may lead to a mobility-related turnover pattern where experienced teachers consistently transfer out of less desirable low-SES regions to accept positions in more desirable high-SES regions.

The uniform salary schedule for teachers is another aspect of the employment system that might exacerbate the emergence of such a mobility-related turnover pattern. In Turkey, teachers with the same level of teaching experience earn the same base salary, no matter which public school they teach in. In the absence of any monetary incentive to keep teachers in low-SES locations, senior teachers in these underdeveloped locations are expected to transfer to schools in relatively more-developed regions once they have adequate seniority scores to do so. The possibility for such a mobility pattern gets even stronger through another practice: the order followed in allocating teachers to vacant positions in schools. Accordingly, vacancies arising from regular courses, such as retirements or student population changes, are filled first by senior teachers seeking transfers, before initial assignments of novice teachers. The vacancies left out, if any, and positions vacated by senior teachers are then filled by novice teachers through initial assignments. This order in teacher allocation has two possible implications. First, compared to reverse order, the present order increases the vacancy alternatives in more desirable high-SES regions among which senior teachers in low-SES regions can choose. Therefore, it may further exaggerate the emergence of the turnover pattern described above. Second, depending on the extent to which such a mobility pattern is experienced, it may also result in a higher concentration of novice teachers in less desirable low-SES regions.

Another aspect of the system that may also disfavor students in relatively less-developed regions is related to the criteria used for new assignments. New teachers in Turkey are assigned to schools solely based on their school preferences and test scores in the Public Servant Selection Exam (KPSS), a multiple-choice test that measures prospective teacher's

[1] There are some exceptions to this practice. For instance, the local education authorities have the right to transfer teachers across schools within their locales, largely to increase effectiveness of their scheduling. Moreover, they also have the right to employ substitute/temporary teachers.

knowledge in several subject and pedagogical domains. Under this current assignment practice, prospective teachers with higher test scores have greater control over their assignments. Therefore, given the absence of any monetary incentives to encourage prospective teachers to go to less-developed regions, one would expect these teachers with higher test scores to choose schools in more-developed regions with better working conditions. This may result in an inequitable distribution of novice teachers in terms of their KPSS test scores. Accordingly, students in relatively less-developed regions may consistently get novice teachers with lower KPSS scores. If the KPSS score is taken as an indicator of teacher effectiveness, this may present a serious disadvantage to students in these regions.

Here, an important policy question might arise: How predictive is the KPSS test score of teacher effectiveness? First, it is important to note that KPSS is not considered as a qualification/competence exam because there is no minimum score requirement to enter the profession. Moreover, there are many critics asserting that a higher score on the KPSS may indicate a well-established theoretical knowledge in both pedagogic and subject-matter domains, but it does not warrant positive professional performance (Adiguzel, 2013). Nonetheless, using TIMSS data, Dinçer (2013) identifies a causal link between the KPSS-based teacher selection policy and student achievement. The present study assumes, without any intend to suggest that the KPSS test score is the best or sufficient indicator of positive professional performance, that the KPSS test score can be considered as an indicator of teacher effectiveness among others, particularly for core subject teachers at the secondary level who are required to take an additional subject test as part of the KPSS test.

Methodology

The main purpose of this study is to analyze the initial assignments of novice teachers and voluntary transfers of senior teachers to determine whether there is any kind of sorting pattern in the allocation of novice and experienced teachers to schools across regions, particularly across provinces, in Turkey. Specifically, it attempts to answer the following specific research questions:

- Are there differences among regions in terms of the numbers and KPSS test scores of novice teachers they receive?
- Is there a relationship between the socioeconomic development levels of provinces and (i) the numbers and the KPSS test scores of the novice teachers they received, and (ii) the numbers and the experience levels of the transferring senior teachers they received?

In order to answer these questions, the study utilizes initial teacher assignment (ITA) data and inter-provincial voluntary teacher transfer (IVTT) data published on the MONE website. In analyzing the data, quantitative approaches that include both descriptive and correlational analyses are employed. Detailed information about each dataset and data analysis approaches is provided in the following subsections. It is important to note at the outset that the methodology specified in this study does not seek causality or the determinants of teacher allocation, but rather aims to explore and give a detailed picture of how new and experienced teachers are allocated across regions in Turkey and how this might be related to providing unequal education in a systematic way.

Description of Data and Data Analysis Procedures

In Turkey, both the initial assignments and the voluntary transfers are performed centrally by the MONE. Given the competitive nature of assignments and transfers, the

MONE publishes detailed information for new assignments and voluntary transfers after each new assignment and voluntary transfer term for the sake of transparency and accountability. Both the ITA and the IVTT data used in this study are collected from the MONE website and cover the entire initial assignments and voluntary transfers that took place in between 2010 and 2014 at all levels (K-12). The merged initial assignment data include information for 223,634 assignments whereas the merged voluntary transfer data include information for 89,189 voluntary transfers carried out within the aforementioned five-year time frame. In addition to these extensive datasets, the Socio Economic Development Index (SEDI) developed by the Ministry of Development to measure the development level of provinces is also employed for provincial level correlational analysis.

Analysis Based on ITA Data

The initial assignment data incorporate the following information for each assignment: the teaching subject, name, and location of the school that the assignment was made to, and the KPSS score of the assigned teacher. This dataset is used to descriptively analyze initial assignments to determine whether there are regional differences in the average KPSS scores of the newly assigned teachers and in the average number of newly assigned teachers per 1000 students (hereafter referred to as "AvNewP1000"). Moreover, Pearson product-moment correlation coefficients are computed at the provincial level to examine the relationship between the SEDI score of provinces and (i) the average KPSS scores of their initially assigned teachers, and (ii) their AvNewP1000.

To calculate the AvNewP1000 for a region/province, firstly, the total number of newly assigned teachers that a region/province received is divided by the total number students in that region/province for each year from 2010 to 2014; then, their average is multiplied by 1000. The rationale for using the AvNewP1000 instead of total assignment numbers is that the size of the education system in each region/province differs greatly from one region/province to another. Simply using assignment numbers might be misleading as the inter-regional/provincial differences in initial assignment numbers might be the reflection of the inter-regional/provincial differences in the size of education systems. It would be expected that the larger the education system the larger the need for new teachers. The AvNewP1000 eliminates this limitation as it accounts for the size of the education system (i.e., student numbers) in each region/province.

Analysis Based on IVTT Data

The inter-provincial voluntary teacher transfer data incorporate the following information for each voluntary transfer: the teaching subject, name, and location of the school that the teacher was transferred to, and the seniority score and service time (in days) of the transferring teacher. The transfer data have one limitation that prevents us from investigating regional differences regarding transferring teachers: information about departing school is not included in the data. As some of the inter-provincial transfers could be between the provinces within the same region, regional comparisons without this information can be misleading. However, since the transfers are between provinces, it is possible to examine differences across the provinces. In order to do so, Pearson product-moment correlation coefficients are computed at the provincial level to examine the relationship between the SEDI score of provinces and (i) the average service time (hereafter referred to as "AST") of teachers transferred to provinces, and (ii) their average number of transferred teachers per 1000 students (hereafter referred to as "AvTransP1000"). To calculate the AvTransP1000 for a

region/province, firstly, the total number of transferring teachers that a region/province received is divided by the total number students in that region/province for each year from 2010 to 2014; then, their average is multiplied by 1000. The AvTransP1000 is used with a similar rationale to the AvNewP1000.

Findings

This section presents the findings of descriptive and correlational analyses performed based on ITA and IVTT data. As previously noted, the analyses based on ITA data are performed at the regional and provincial level, and the analyses based on IVTT data are performed at the provincial level due to the aforementioned limitation about IVTT data.

Findings Related to ITA Data

Table 1 displays the regional distribution of all novice teachers assigned between 2010 and 2014. As shown on the table, a great majority of the novice teachers started their teaching career in relatively less-developed eastern regions. Of all the initial teacher assignments performed between 2010 and 2014, about 60 percent were allocated to the South East, Middle East, and North East Anatolia regions. As described in the previous section, using the teacher assignment numbers and the student numbers, AvNewP1000 is calculated at the regional level to compare regional differences more precisely. The differences in AvNewP1000 across regions are striking as well (Table 1). While the AvNewP1000 ranges from .6 to 1.3 in relatively more-developed western regions (i.e., Istanbul, West Anatolia, East Marmara, Aegean, West Marmara, and Mediterranean), in relatively less-developed eastern regions (i.e., East Black Sea, North East Anatolia, Middle East Anatolia, South East Anatolia), it ranges from 3.2 to 9.2. These regional differences in AvNewP1000 reveal that already-disadvantaged students in the less-developed eastern regions are disproportionately far more likely to be exposed to novice teachers than their counterparts in other regions.

	Initially Assigned Novice Teachers		
Regions (NUTs Level 1)	N	%	AvNewP1000
TR1 (Istanbul)	19,469	8.71	1.27
TR2 (West Anatolia)	3,833	1.71	1.33
TR3 (East Marmara)	8,195	3.66	0.86
TR4 (Aegean)	9,826	4.39	1.30
TR5 (West Marmara)	5,524	2.47	0.69
TR6 (Mediterranean)	12,786	5.72	1.10
TR7 (West Black Sea)	10,580	4.73	2.39
TR8 (Central Anatolia)	7,927	3.54	1.74
TR9 (East Black Sea)	8,387	3.75	3.22
TRA (South East Anatolia)	27,518	12.30	9.17
TRB (Middle East Anatolia)	39,548	17.68	7.30
TRC (North East Anatolia)	70,041	31.32	5.49
TR (All Regions)	223,634	100.00	2.55

Table 1: Geographic Distribution of Newly Assigned Novice Teachers

Table 2 displays the regional differences in the mean KPSS scores of all novice teachers assigned between 2010 and 2014. Novice teachers assigned to the South East, Middle East, and North East Anatolia regions have lower mean KPSS scores than their counterparts in other regions. The difference between eastern and western regions is anywhere from about 3 to 5 points. Moreover, as seen in Table 2, only the novice teachers assigned to these regions have average KPSS scores lower than the country average. These differences clearly suggest that novice teachers assigned to less-developed eastern regions have lower average KPSS scores than their counterparts assigned to other regions.

		KPSS Score			
Regions (NUTs Level 1)	N	Mean	SD	Min	Max
TR1	19,469	77.76	9.22	31.07	100.00
TR2	3,833	78.66	9.89	21.61	100.00
TR3	8,195	79.91	9.44	32.71	100.00
TR4	9,826	80.27	8.39	32.41	99.52
TR5	5,524	79.56	8.73	25.84	99.10
TR6	12,786	78.09	9.49	29.75	99.99
TR7	10,580	78.76	8.99	14.77	100.00
TR8	7,927	79.50	8.66	27.87	98.28
TR9	8,387	78.24	9.07	21.36	98.04
TRA	27,518	75.73	9.26	14.10	98.15
TRB	39,548	75.31	9.24	12.96	99.33
TRC	70,041	75.15	9.45	16.92	98.28
TR (All Regions)	223,634	76.70	9.43	12.96	100.00

Table 2: Average KPSS Scores of Newly Assigned Teachers by Regions

Besides these descriptive analyses at the regional level, correlation analyses are also performed at the provincial level using the Pearson's product-moment correlation to examine the relationship between the socioeconomic development level (SEDI score) and (i) the AvNewP1000, and (ii) the average KPSS scores of the novice teachers assigned between 2010 and 2014. The results are displayed on Table 3. Analysis based on the AvNewP1000 indicates a strong negative correlation between the SEDI score and the AvNewP1000, $r(79) = -.693$, $p < .001$. Moreover, analysis based on the average KPSS score of novice teachers reveals a strong positive correlation between the SEDI score and the average KPSS score, $r(79) = .625$, $p < .001$. Together, these findings suggest that provinces with lower SEDI scores tend to receive more novice teachers and also that novice teachers assigned to provinces with lower SEDI scores tend to have lower average KPSS scores. It is important to note here that a great majority of the provinces with the lowest SEDI scores are located in the underdeveloped eastern regions.

Provincial Level Variables	1	2	3
1. AvNewP1000	1		
2. Average KPSS Score	-,721**	1	
3. SEDI Score	-,693**	,625**	1

Table 3: Pearson Correlations for ITA Data
*** Correlation is significant at the .001 level (2-tailed).*

Another important finding of correlational analyses is that the AvNewP1000 and the average KPSS score are strongly and negatively correlated, r (79) = -,721, p < .001. A similar finding is observed by the Pearson's product-moment correlation calculated at the provincial level between the total number of received novice teachers and the average KPSS scores, r (79) = -.556, p < .001. These findings imply that as the number of novice teachers assigned to a province increases, the average KPSS score of novice teachers assigned to that province decreases. This can be attributed to the centralized teacher assignment system in Turkey, where teachers are assigned to their preferences after they are sorted based on their preferences and KPSS scores. As the number of opening increases in a province, it is expected that the cutting KPSS score and therefore the average KPSS score will decrease. Moreover, it is also expected that more preferred developed provinces, which usually have fewer openings, will be filled by novice teachers with higher KPSS scores.

In order to examine whether these correlation patterns are consistent across years and teaching subjects/levels, Pearson's product-moment correlations are calculated at the provincial level for each individual year (2010 through 2014) and for each individual teaching subject/level (kindergarten, primary, literature, mathematics, and science). Table 4 displays the results of provincial level correlations between SEDI score and initial teacher assignment variables (AvNewP1000 and average KPSS score) for each individual year. The results suggest that patterns observed about the direction of the correlations remain unchanged across years for both AvNewP1000 and average KPSS score. Moreover, with the exception of the year 2013, the strength of the correlations only changes slightly for both variables.

Variables	SEDI Score
AvNewP1000	
2010	-,636**
2011	-,688**
2012	-,628**
2013	-,607**
2014	-,681**
Average KPSS Score	
2010	,579**
2011	,557**
2012	,605**
2013	-,032
2014	,613**

Table 4: *Pearson Correlations across Years for ITA Data*
*** Correlation is significant at the .001 level (2-tailed).*

Table 5 displays the results of provincial level correlations between SEDI score and initial teacher assignment variables (AvNewP1000 and average KPSS score) for each individual teaching subject/level. The results suggest that both the strength and the direction of the

correlations remain more or less unchanged across all subjects/levels for both AvNewP1000 and average KPSS scores. In general, these findings presented in Table 4 and Table 5 suggest that the observed relationships between the socioeconomic development level and the teacher assignment variables are consistent across years and teaching subjects/levels.

Variables	SEDI Score
AvNewP1000	
Kindergarten	-,718**
Primary	-,667**
Literature	-,623**
Mathematics	-,629**
Science	-,666**
Average KPSS Score	
Kindergarten	,686**
Primary	,663**
Literature	,428**
Mathematics	,438**
Science	,632**

Table 5: ***Pearson Correlations across Subjects/Levels for ITA Data***
*** Correlation is significant at the .001 level (2-tailed).*

Findings Related to IVTT Data

Given that the mobility of teachers with some experience has the potential to affect the overall distribution of teacher experience, it is important to analyze mobility patterns of senior teachers. This study utilized IVTT data to examine the inter-provincial mobility patterns of senior teachers. Due to the aforementioned limitation of IVTT data, only provincial level correlational analyses are performed using IVTT data to examine the relationship between the socioeconomic development level (SEDI score) and (i) the AvTransP1000, and (ii) the AST of transferred senior teachers.

Analysis based on the AvTransP1000 indicates a moderate positive correlation between the SEDI score and the AvTransP1000, $r(79) = .423$, $p < .001$. Moreover, an analysis based on the AST of transferring senior teachers reveals a strong positive correlation between the SEDI score and the AST, $r(79) = .582$, $p < .00$. Overall, these findings demonstrate that unlike initial assignments, provinces with lower SEDI scores tend to receive fewer senior teachers through transfers. The findings further suggest that senior teachers transferred to these provinces have a lower AST or, more precisely, lower experience levels.

Provincial Level Variables	1	2	3
1. AvTransP1000	1		
2. AST	,173	1	
3. SEDI Score	,423**	,582**	1

Table 6: Pearson Correlations at the Provincial Level for IVTT Data
*** Correlation is significant at the .001 level (2-tailed).*

In order to examine whether these correlation patterns are consistent across years and teaching subjects/levels, Pearson's product-moment correlations are calculated at the provincial level for each year and for each teaching subject/level. Table 7 displays the results

of provincial level correlations between the SEDI score and the teacher transfer variables (AvTransP1000 and AST) for each year. The results suggest that while the patterns observed about the direction of the correlations remain unchanged for both AvTransP1000 and AST variables, the strength of the correlations shows slight variations over time.

Variables	SEDI Score
AvTransP1000	
2010	,407**
2011	,342**
2012	,530**
2013	,212*
2014	,278*
AST	
2010	,524**
2011	,338**
2012	,437**
2013	,573**
2014	,539**

Table 7: Pearson Correlations across Years for IVTT Data
*** Correlation is significant at the .001 level (2-tailed).*

Table 8 displays the results of provincial level correlations between SEDI score and teacher transfer variables (AvTransP1000 and AST) for each teaching subject/level. Again, the direction of the correlations remains unchanged across all subjects/levels. In terms of the strength of the correlations, there are only slight variations for core subjects at the secondary level: literature, mathematics, and science. Nonetheless, the strength of relationships for the primary and kindergarten levels decreases remarkably for AvTransP1000 and AST variables, respectively.

This can be explained by the current status of kindergarten and primary education in Turkey. Recently, kindergarten education has been rapidly expanding in Turkey. Due to such rapid expansion, a great majority of the kindergarten teachers have been appointed more recently. As a result, the experience levels of kindergarten teachers are more homogenous. Therefore, it is expected that the AST of transferring kindergarten teachers does not vary across receiving provinces as much as that of transferring teachers in other levels. On the other hand, unlike kindergarten education, primary education has been compulsory for a long time in Turkey, and the gross enrollment ratio at this level has already reached or surpassed the 100% goal in most developed regions. Given this fact and the well-structured nature teacher-student matching at this level (i.e., one teacher for each class), new openings are rare in the developed provinces and are usually filled by transferring teachers with very high service time. Therefore, it is not surprising to observe that, at this level, the AvTransP1000 is weakly correlated with the SEDI score and that the correlation between the AST and the SEDI score gets stronger. Overall, with these exceptions being acknowledged, it can be concluded that the observed relationships between the socioeconomic development level variables and the teacher transfer variables are consistent across years and teaching subjects/levels.

Variables	SEDI Score
AvTransP1000	
Kindergarten	,433**
Primary	-,198
Literature	,445**
Mathematics	,463**
Science	,348**
AST	
Kindergarten	,325**
Primary	,620**
Literature	,416**
Mathematics	,486**
Science	,455**

Table 8: Pearson Correlations across Subjects/Levels for IVTT Data
***Correlation is significant at the .001 level (2-tailed).*

Discussion and Conclusions

This study has analyzed the initial assignments of novice teachers and voluntary transfers of senior teachers to determine whether there is a pattern in the allocation of novice and experienced teachers to schools across regions, particularly across provinces, in Turkey. The results provide clear evidence that both novice and senior teachers are unevenly allocated across regions both in terms of their quantity and quality. With regard to quantity, the results of this study suggest that compared to more-developed provinces in the western part of the country, underdeveloped eastern provinces receive disproportionately more novice teachers through initial assignments and fewer senior teachers through inter-provincial voluntary transfers. As far as quality is concerned, the findings suggest that novice teachers assigned to underdeveloped eastern provinces have lower average selection test scores than their counterparts assigned to more-developed western provinces. The findings also suggest that the average experience level of senior teachers allocated to underdeveloped eastern provinces is lower than that of senior teachers assigned to more-developed western provinces. Additionally, the findings derived from correlational analyses also reveal that the observed pattern in both initial assignments and voluntary transfers is consistent across years, grade levels, and secondary-level core subjects, with minor exceptions.

There are several possible explanations of this observed teacher sorting pattern. At the micro level, preferences of teachers might offer a potential explanation. Previous research in both centralized and decentralized systems provides strong evidence that teachers prefer working in affluent schools with higher socioeconomic contexts (Boyd et al., 2005; Hancock and Scherff, 2010; Hanushek et al., 2004; Loeb et al., 2005). This is particularly true if the employment system offers no monetary incentives for teachers to stay in schools with low socioeconomic contexts. Teachers in Turkey are no exception to this phenomenon. In the absence of any monetary incentive to encourage teachers to work in hard-to-teach locations, the vast majority of teachers with any other choice avoid working in less-developed eastern territories. This is not only because of working conditions related to schools/student compositions but also due to the harsh living conditions posed by underdevelopment, remote geography, and severe climate (Özoğlu, 2015).

At the macro level, teacher employment policies appear to contribute to the emergence of this pattern. The extant research suggests that district or government level

employment policies that make it easier for senior teachers to act on their preferences are approved to produce higher teacher mobility from low-SES schools/locations to high-SES ones (Imazeki and Goe, 2009). Such a mobility pattern usually leads to a higher concentration of novice teachers in schools/locations with low-SES context, which can affect the quality of education students in low-SES context receive. This is exactly what appears to be taking place in the Turkish context. After three years of compulsory service, all teachers in Turkey get the right to have a say over where they teach, and as indicated above, most prefer to transfer to schools in high-SES regions. Moreover, as mentioned earlier, teacher employment policies in Turkey by design give priority to senior teachers over novice teachers in filling regular vacancies. As a result, novice teachers are often left with vacancy options in schools with less desirable low-SES context, largely arising from seniority transfers. Luckily, Turkey has a large oversupply of prospective teachers waiting for assignments and, therefore, experiences no difficulty in filling these vacancies. However, another sorting pattern appears to emerge in assigning novice teachers to these vacant positions. That is, the least-developed eastern provinces receive novice teachers with lower selection test scores.

The teacher sorting pattern revealed by this study provides empirical evidence to support Özoğlu (2015) in his assertion that the centralized teacher employment system in Turkey functions as "fill-and-drain valves" that cycles as follows: novice teachers are often assigned to schools located in less-developed eastern territories; soon after they gain some experience, they are drained out of these schools and transferred to schools in more-developed western territories; and positions vacated by these transferring teachers are then again filled by novice teachers. This sorting pattern poses a significant policy challenge toward achieving the goal of quality education for all. As noted at the beginning of the paper, students in less-developed eastern regions are socioeconomically disadvantaged and already performing at the lowest levels of achievement. Therefore, they are most in need of effective, high-quality teachers. However, as the above analyses suggest, novice and/or less experienced senior teachers are disproportionately assigned to these underdeveloped eastern regions with higher proportion of disadvantaged students. This skewed distribution of novice teachers can further exacerbate the regional inequalities observed in student outcomes. Therefore, policies that aim at reducing regional achievement gaps in Turkey should certainly take the dynamics that potentially contribute to the unequal distribution of teacher quality into account.

This study provides some suggestive evidence regarding the possible effects of centralized teacher allocation policies on overall distribution of teachers. The results suggest that current employment policies need to be overhauled to reduce regional disparities in the distribution of teacher quality. Of critical concern is the seniority-based transfer provision, which appears to reinforce the chances that students in underdeveloped eastern regions will be exposed systematically to novice teachers. Moreover, while the current differentiated seniority score provision (in alignment with compulsory service provision) can motivate (urge) novice teachers to go to schools in underdeveloped eastern regions, this provision—along with seniority-based transfer provision—also appears to facilitate their departure from these regions. Effectiveness of these provisions should certainly be reexamined, and more effective policies should be developed to attract and retain teachers in these underdeveloped eastern regions. Monetary incentives such as differential pay might be an effective policy measure. Moreover, special policy measures will be necessary to overcome concerns about working conditions of schools and living conditions of their neighborhoods. Such policy measures should be supported by effective regional economic development policies.

The findings of this study also have some important implications for teacher education programs, both at the pre-service and in-service levels. Evidence from different nations suggests that pre-service teachers studying in teacher education programs are usually under-

informed and have misconceptions about living and teaching in underdeveloped rural areas (Barley and Brigham, 2008; Hudson and Hudson, 2008; Kızılaslan, 2012; Partington, 1997). This issue has the potential of negatively impacting potential recruitment and retention of teachers to schools in rural or remote areas (Sharplin, 2002). Therefore, various strategies and initiatives have been developed and implemented in different countries to better inform pre-service teachers about the conditions of teaching in rural schools, to change their preconceptions about rural living and working, and particularly to motivate them to teach in less-developed rural areas. For instance, in response to the long-standing teacher turnover issue in rural Australia, policymakers in Australia have been redesigning teacher education programs and developing targeted curriculum, such as extended practicum in rural and remote areas, to better prepare pre-service teachers for the realities of schooling and living in underdeveloped rural areas (Klein, White, and Lock, 2013). These targeted programs that provide pre-service teachers with firsthand rural experience are proven to be successful in dispelling pre-service teachers' misconceptions about rural living and in changing their attitudes for teaching in rural schools (Halsey, 2005; Hudson and Hudson, 2008).

Similar initiatives could be introduced into the pre-service teacher training programs in Turkey to increase their effectiveness in preparing prospective teachers for rural or less-developed eastern regions. Given that most pre-service teacher education programs are located in urban universities, predominantly on the western part of the country, such a strategy could be particularly effective, although costly, in influencing prospective teachers' preferences and in attracting and retaining qualified teachers in these underdeveloped eastern regions. In addition to targeted pre-service programs, well-designed induction and mentoring programs in rural schools could be another strategy to increase teacher retention in less-developed eastern regions. Such programs could be helpful for beginning teachers—majority of which begin their careers in rural or less-developed eastern regions—to better cope with the challenges associated with living and teaching in the East and rural Turkey (Özoğlu, 2015). In fact, international evidence suggests that well-operated induction and mentoring programs are very influential and cost-effective, particularly compared to salary-based incentives, in increasing teacher retention (Brill and McCartney, 2008).

Overall, this study provides some important policy information on reducing regional disparities in the distribution of teacher quality. Moreover, it presents international evidence from a centralized education system regarding an issue (i.e., unequal distribution of teachers) that has traditionally received little research attention outside of decentralized education systems, such as that of Australia and the United States. The findings of this study, in this sense, are particularly important because they show that even in a centralized education system with highly centralized employment policies, it is possible to have an unequal distribution of teacher quality if the teacher allocation policies are poorly designed.

Conclusions derived from this preliminary investigation suggest that future empirical research that provides direct evidence about the determinants of the observed sorting pattern is necessary and valuable. This study sets the stage for such future research. However, it has a number of limitations that should be addressed in subsequent research. For instance, the analyses on seniority-based transfers are limited to inter-provincial voluntary transfers. Besides inter-provincial voluntary transfers, there are also other types of transfers in Turkey that also deserve further investigation. These include excuse transfers and transfers related to compulsory service requirements. Given that these transfer types constitute an important portion of all transfers and that they have the potential to impact the distribution of teacher quality, future research should explore these transfers, particularly their effects on the overall distribution of teachers. Moreover, both the ITA and IVTT datasets used in this study are limited in their nature for exploring micro-level, across-school mobility. Future research should consider using a more detailed teacher allocation data to perform school-level

analysis. This is important because the allocation of teachers across schools within a town or province might also be producing a skewed distribution of teacher quality.

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