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I. Introduction

In almost all developing countries, the post–World War II period has been marked by significant population movements that emerged as both causes and consequences of economic and social development, as well as urbanization (Yaukey, Anderton, and Lundquist 2007). Turkey is no exception. While Turkey's urban population made up about 25% of its total population during the 1927–50 period, this proportion had increased to 42% by 1975 because of massive rural-to-urban migration. In addition, reflecting uneven economic and social development across urban areas over the past 3 decades, urban-to-urban migration has become a predominant type of population movement within the country. Despite this fact, during the same time period, the proportion of the population living in urban areas continued to increase, reaching 65% in 2000. According to the latest census in 2000, in which individuals' mobility is likely to have been underreported, one in 10 had changed their province of residence during the past 5-year interval and three in 10 resided in a province different from their province of birth. Even these underestimated population figures suggest that many individuals in Turkey are in a continuous, ongoing search for a location where they can improve their access to opportunities and secure their future economic and social well-being, as well as those of their offspring.

As argued in the international migration literature, migration may alter the labor-market success not only of individuals who change their location of residence (i.e., the migrant population) but also of those who previously resided

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in migrant-receiving locations, that is, the native population (Borjas 1994; LaLonde and Topel 1997). In particular, internal migration may result in the spatial redistribution of labor-market opportunities across locations because it also is associated with the spatial redistribution of resources, which are critical determinants of labor-market outcomes. Consequently, as Hoynes, Page, and Stevens (2006) have suggested, because having access to labor-market opportunities is an important determinant of both individuals' and families' poverty status, those residing in locations with different densities of migrant inflows may be subject to different local labor-market conditions, leading them to have varying poverty incidence rates across these locations.[1] In fact, such consequences of internal migration may become more important for developing countries, as well as for the emerging and transitional economies that have experienced profound economic and social changes during the past 30 years. Beginning in the first half of the 1980s, for example, Turkey has had fundamental shifts in economic policies that have enhanced its market-led economy, such as the privatization of state-owned enterprises, significant reductions in agricultural subsidies, and the penetration of the domestic economy by foreign capital. The country has also been affected by substantial investments in the modernization of infrastructure services, such as telecommunication and transportation services, as well as by social and political turmoil, such as the armed conflict that has been heavily taking place in the country's southeastern region and the forced displacement that has occurred as a result of this conflict. In this regard, to assess the past experiences of rapidly changing countries and to formulate new policies to remedy the negative consequences of these changes, if there exist any, it will be informative to evaluate the labor-market consequences of population movements that might have been caused by countries' economic and social transformations, such as those that are still observed in Turkey. Focusing on Turkey's experiences, this study aims to evaluate the causal relation between the inflow of internal migrants and labor-market outcomes for both the native and the migrant populations.

[1] Individuals' migration status can be both the cause and consequence of their poverty status. For example, exploring determinants of geographic labor mobility in Vietnam, Phan and Coxhead (2010) provide evidence for the mechanism through which poverty-related factors may prevent individuals from moving from provinces with lower employment opportunities to those with higher employment opportunities, contributing to an increase in income equality across provinces. In addition, they illustrate how population movements between provinces may diffuse the benefits of economic growth and income inequality across provinces. Different from their study, I here attempt to estimate the causal effects of migrant inflows for the entire population's labor-market outcomes in the destination provinces, which have proved to be the most important predictor of whether members of that population live in poverty or not.

To accomplish this task, using 1990 and 2000 Turkish census data, I exploit variations in the densities of the inflow of internal migrants experienced by provinces to estimate the causal effects of internal migration on natives' labor-market outcomes. To measure natives' labor-market performance at the province level, I focus on two major labor-market outcomes for males living in urban areas: the employment-population and the labor force participation–population ratios.[2] To measure the density of the inflow of internal migrants for a given destination province, I use the ratio of the number of working-age migrants to that of working-age natives, where "working age" is defined as encompassing ages 16–64.

Because internal migrants may sort themselves into provinces based on their individual and family characteristics, as well as characteristics of the provinces, it is a challenging task to estimate the causal effects of internal migration on natives' labor-market outcomes. I employ two approaches to address econometric problems caused by this selective nature of migration that can significantly plague the estimated effects of migrant inflows, the result, in part, of the presence of both the time-invariant and the time-varying characteristics of provinces. First, using a two-stage estimation method, the first-difference specification enables me to examine a causal relation between the change in the internal migrant–native ratio and the change in natives' outcomes, assuming that province-level characteristics do not change over time. However, although the first-difference estimation can remove the province-level fixed effects, it still might yield biased estimates of the internal migrant–native ratio's effect because of the presence of temporary shocks at the province level, which may be related to both the internal migrant–native ratio and the natives' labor-market outcomes. To address this concern, I use the internal migrant–native ratio in 1990 as an instrument variable for the change in the internal migrant–native ratio between 1990 and 2000 in the first-differenced equation.

Using these econometric methods, I present reduced-form estimates of the effects of internal migration on native males' labor-market outcomes as well as the outcomes of other native and migrant groups. The estimation strategy is to weigh the relative strengths of the displacement effect that may have resulted from the change in the province-level labor supply and the labor demand effect that may have been caused by the change in demand for nontradable goods at the province level, where both effects were presumably induced by the province-level change in the inflows of internal migrants.

[2] For the sake of brevity, in the remainder of this article, the employment-population ratio will be referred to as the employment ratio; likewise, the labor force participation–population ratio will be referred to as the LFPR.

Overall, the estimation results point to a negative association between the inflow of internal migrants and native males' labor-market outcomes. Heterogeneity in the estimated effects prevails with respect to the skill level of natives, as well as those of different migrant and native groups.

The remainder of this article consists of five sections. Section II provides the theoretical background, focusing on the possible causal mechanisms through which the inflow of internal migrants may affect natives' labor-market outcomes. Section III presents background information on internal migration in Turkey. Section IV explains the data and econometric methods used in this study. Section V discusses the estimation results for labor-market outcomes, with a special focus on the heterogeneity of the estimated effects by natives' characteristics, as well as those of migrant groups. Section VI concludes.

II. Theoretical Background and Literature Review

The labor economics literature extensively examines the effects of migration on natives' employment outcomes, with a focus on international migration. Research on migration suggests possible determinants of the causal relation between the inflow of migrants and natives' outcomes (Altonji and Card 1989; Borjas 1994; LaLonde and Topel 1997; Friedberg 2001). The first possible determinant is the size and quality of the migrant population relative to that of the native population: that is, the proportion of migrants in the total local population and differences in the educational level, work experience, occupation, and industry between natives and migrants. The second is related to the degree of substitution and complementarity between natives and migrants in production and the difference in labor supply and labor demand elasticities between natives and migrants. The third is linked to a change in the demand for nontradable goods and services produced by natives as a result of migration.

For example, the inflow of low-skilled migrants is most likely to decrease employment opportunities for low-skilled natives. This adverse effect is heightened with a higher degree of substitution between low-skilled migrants and natives, higher labor supply elasticities for migrants compared to that of natives, and lower demand elasticities for low-skilled workers (Friedberg 2001). Furthermore, the net effect of low-skilled migrants on natives' total employment depends on whether low-skilled migrants and high-skilled natives are substitute or complementary inputs. To the extent that they are complementary, the adverse effect of low-skilled migrants may be lessened.

The other determinant that may offset the negative effects of migrants on natives' employment outcomes is an increase in the aggregate demand in the local economy, causing a general equilibrium effect (Pischke and Velling 1997). When the inflow of migrants causes an increase in the demand for nontradable

goods produced by natives, negative effects may be further lessened. In addition to this general equilibrium effect in the local economy, any effect of migration may not be observed as a result of the general equilibrium effect in the national economy, depending on the degree of mobility of goods and services and the factors of production across local areas. Thus, in sum, economic theory suggests that it is impossible to determine a priori the causal effects of migration on natives' employment outcomes. The nature of the relations between migration and natives' employment outcomes can be determined with a well-designed econometric study.

Research on international migration employs various econometric approaches to estimate the causal effect of migration on natives' employment outcomes. Researchers attempt to control for the strong possibility that migrants select or are selected into geographical locations based on their individual characteristics, as well as the locations' characteristics that are related to employment outcomes. One approach is to exploit variations in the density of the migrant population across geographical locations to establish a causal relation between migration and natives' employment outcomes (Altonji and Card 1989; Pischke and Velling 1997). Examining the relation between change in the proportion of immigrants and change in natives' employment outcomes across 120 large U.S. cities, Altonji and Card (1989) found no systematic relation between immigrant flows and employment outcomes for natives. Using a similar methodology, Pischke and Velling (1997) found that the proportion of immigrants had no significant effect on either the employment rate or the unemployment rate for natives in Germany. In another approach, specific migration episodes that are caused by factors other than economic ones are used to identify the causal effects of migration because they provide a quasi-natural experiment framework to eliminate the endogeneity of where individuals choose to migrate. Card (1990), for example, examined the arrival of 250,000 Cubans in Miami in 1980 and found no significant effects of this massive migration on the Miami labor market. Likewise, examining the effects on the French labor market of 900,000 people who emigrated from Algeria in 1960, Hunt (1992) found no effect on the natives' employment rate and a considerably small, negative effect on the natives' unemployment rate.

There may be several reasons for the patterns indicating that migration has no effect on natives' employment outcomes in studies that have used variations in the number of migrants across geographical locations (Card 1990; Borjas 1994; Friedberg 2001). First, to the extent that the inflow of migrants generates more demand for nontradable products that are produced by native workers, the general equilibrium effect at the regional level may balance the negative effect of migration on natives' employment outcomes. Second, the general equilibrium effect at the national-economy level may contribute to observations

indicating that migration has no effect, depending on the extent to which regional economies are integrated. Finally, natives may move to other geographical locations in response to the inflow of migrants, resulting in migration having no effect on natives' employment outcomes. To address these issues, particularly the outflow of natives, Friedberg (2001) focused on occupation to examine the effect on the Israeli labor market of the massive inflow from the former Soviet Union during the period 1990–94, which increased Israel's labor supply by 13.6%. Friedberg (2001) exploited the change in the proportion of immigrants across occupations to identify migration's causal effect on natives' employment opportunities. She found that migration had no systematic or statistically significant effect.

III. Background on Internal Migration in Turkey

Research on internal migration in Turkey suggests that there have been three main periods of internal migration over the past 50 years (Munro 1974; Gedik 1996, 1998; İçduygu and Ünalan 1998; İçduygu and Sirkeci 1999; Peker 1999). The first period, covering the 1950s and the first half of the 1960s, was marked by rural-to-urban migration because of push factors originating from rural areas, such as the shift from labor-intensive to capital-intensive technologies in agricultural production, an increase in the rural population, physical limitations of the land that could be used for economic gain, and the unequal distribution of land ownership. At the same time, the labor force shortage, which emerged as a result of industrialization, and better living conditions (including better education and health services) in urban areas became important pull factors that increased migration from rural to urban areas. At the end of this period, the proportion of the population living in urban areas, which was relatively stable at around 25% in the first 30 years of the Republic of Turkey, increased to 38%.[3] Because of their rural origin, these new arrivals in the urban labor market were less likely than natives to have adequate education, necessary skills, and other labor-market-related resources to compete with natives in the urban labor market.

The second period began in the second half of the 1960s and ended in the late 1970s, when the proportion of the urban population reached 44%. During this period, in addition to the push and pull factors that played important roles in the previous period, newly established migrant networks, increased investment in infrastructures such as transportation and communication, and

[3] All estimates reported in this article for time periods before 1985 are obtained from the Turkish Statistical Institute's 2007 publication titled *Statistical Indicators, 1923–2007*. For time periods after 1985, most estimates are based on my own calculations.

better educational and health resources and services in urban areas accelerated and made the flows of the rural population into urban areas self-sustaining. Furthermore, beginning in the second half of the 1970s, because of an uneven distribution of economic and social development across urban areas, urban-to-urban migration emerged as a main form of population movement in Turkey.

Finally, during the third period (1980–2000), investments made in communication and information technologies, as well as those made in roads, removed any obstacles that might have prevented mobility across places of residence within the country. By the end of this period, 65% of the total population were living in urban areas. During the period, as a result of a shift from state-oriented to market-oriented policies, the Turkish economy had been restructured by privatizing public enterprises, making institutional changes to attract inflows of foreign capital, removing trade restrictions, and promoting export-oriented policies rather than import substitution polices.

Capturing population movements between types of locations during this transition period, which also covers the time period analyzed in this study, when interprovincial migration patterns over the period 1985–90 and 1995–2000 are examined, migrant flows within urban and rural areas and between urban and rural areas reveal relatively similar patterns. For example, in both time periods, urban-to-urban migration appears to be the main form of population movement across provinces. This type of migration constituted about 70%–72% of the total interprovincial migration, whereas only 10%–14% of all migrants moved from rural to urban areas. Migrants who selected rural areas as destinations made up 16%–19% of total migrants, measuring the sum of the rural-to-rural and urban-to-rural migration. Therefore, during the period analyzed in this study, urban areas appear to be the most important destination locations for interprovincial population movements, providing a justification for why the analysis sample used in the empirical analysis is restricted to urban labor markets.

Compared to the first two periods, the native-migrant distinction in the urban areas becomes less clear-cut in the third period because the migrant population in urban areas contains those who migrated from other urban areas (urban-urban migrant) and those who migrated from rural areas (rural-urban migrants). Considering the fact that rural-urban migrants may have fewer skills or require a longer time period to acquire urban-specific skills, they are more likely to compete with low-skilled natives for employment opportunities. Furthermore, because of the lack of skills and information, rural-urban migrants might be employed in the informal sector, where there is low pay and no job provisions such as retirement benefits and health insurance. However, the census data, which are the only available data containing information on the

migrant population with a sufficient sample size, do not provide the information necessary to uncover the joint determination of the rural-urban migrant population and the size of the informal labor market in urban areas.

In the third period, unlike rural-to-urban migration, the increased urban-to-urban migration may further obscure the native-migrant distinction in urban areas. The selection mechanism that sorts individuals across native and migrant groups may exhibit differences across urban areas with different social, economic, and demographic characteristics. For example, the definitional context of the "native" term for the immobile population in large urban areas may differ from its counterpart in medium and small urban areas. Native individuals in large urban areas may have greater access to educational and employment-related resources during their lifetime and thus have greater labor-market success, whereas their counterparts in small urban areas may have poorer educational and labor-market outcomes and hence be unable to move. When turning attention to the heterogeneity in the migrant population with urban origin in urban areas, it is possible that urban-to-urban migrants with a large urban origin may reap benefits of a better job-location match as a result of their migration decisions, whereas their counterparts with a small urban area origin may have low skills similar to those of rural-to-urban migrants. Thus, given these possible heterogeneities in internal population movements in Turkey, the native-migrant distinction should be considered as crude but as the best possible way to classify individuals based on their mobility information within the last 5 years in the census data. Nevertheless, because the estimation strategy used in this study controls for differences in these characteristics stated above across urban labor markets that may determine individuals' native-migrant status and their labor-market success as well, the analysis sample is restricted to urban male individuals who were residing in all province and district centers at the time of the census.

Furthermore, to depict internal migration patterns in Turkey for the period analyzed in this study, table 1 provides information for population movements between regions, focusing on individuals who changed the province of residence (panel A) and for regions' socioeconomic development index scores, which enable us to differentiate regions in terms of their social and economic development level (panel B). In particular, by focusing on the internal migration that occurred during the 1985–90 and 1995–2000 periods, each row in panel A shows the distribution of the migrant population across destination regions for each region of origin. Together with information in panel B, an examination of interregional patterns suggests that individuals moved from less developed regions, such as the Black Sea and Eastern and Southeastern Anatolia, to more developed regions, such as Marmara and Aegean, confirming migration the-

TABLE 1

THE DISTRIBUTION OF MIGRANT POPULATION BY REGION OF ORIGIN AND DESTINATION AND REGIONAL SOCIOECONOMIC DEVELOPMENT INDEX SCORES

A. Regional Migration Patterns

	Destination Regions													
	Marmara		Aegean		Central Anatolian		Mediterranean		Black Sea		Southeastern Anatolia		Eastern Anatolia	
Origin Regions	Census 1990	Census 2000	Census 1990	Census 2000	Census 1990	Census 2000	Census 1990	Census 2000	Census 1990	Census 2000	Census 1990	Census 2000	Census 1990	Census 2000
Marmara	40.66	36.47	11.67	12.68	15.81	14.94	6.93	7.84	14.95	16.87	3.61	4.07	6.36	7.13
Aegean	21.15	22.92	38.88	36.61	17.26	15.14	8.55	10.39	5.84	5.28	3.64	3.86	4.67	5.79
Central Anatolia	30.28	28.87	12.49	12.75	29.06	29.43	12.12	12.06	8.30	8.00	3.24	3.40	4.50	5.48
Mediterranean	19.60	21.61	11.12	11.77	17.46	19.79	31.12	25.79	4.81	4.59	10.48	9.90	5.42	6.55
Black Sea	60.05	54.43	5.97	7.03	13.58	16.10	3.31	3.96	12.95	14.01	1.48	1.23	2.65	3.24
Southeastern Anatolia	23.63	26.92	13.49	16.36	11.09	12.58	28.98	19.93	4.27	3.21	15.57	14.29	5.68	6.71
Eastern Anatolia	48.19	44.25	15.16	13.86	11.09	14.02	9.93	9.58	4.27	5.18	3.15	3.55	8.22	9.57

B. Regional Socioeconomic Development Index Scores

	Regions													
Score Calculation Data	Marmara		Aegean		Central Anatolia		Mediterranean		Black Sea		Southeastern Anatolia		Eastern Anatolia	
Years in which index scores calculated	1996	2003	1996	2003	1996	2003	1996	2003	1996	2003	1996	2003	1996	2003
Index scores	1.694	1.702	.500	.481	.460	.481	.061	.020	−.543	−.513	−1.036	−1.011	−1.137	−1.162

Source. Regional socioeconomic development index scores are taken from the report prepared for the Turkish Republic State Planning Organization (Dincer, Özaslan, and Kavasoglu 2003).

ories' fundamental prediction that individuals move for better economics and social opportunities.[4] For example, more than half of the migrant population from the Black Sea region, located in northern Turkey (with the third-lowest scores on a socioeconomics development index), chose the Marmara region, located in northwest Turkey (with the highest score on this development index), as a destination region. Likewise, the Marmara region is a most attractive destination region for those from the Eastern Anatolia region, which has the lowest score on the socioeconomic development index. Thus, it appears that Turkey's population movements for the 1985–2000 period were mainly characterized by east-west and north-west migration flows, which also reflects the main directions of population movements during the 1960–80 period (Gedik 1998).

Finally, the 2000 census data provide information on migrants' reported reasons for moving. While one-third (33%) of Turkey's internal migrant population involved work-related moves, such as job transfers and job searches, an additional 39% moved for family-related reasons, such as marriage and family reunion. The remaining migrant population cited education, earthquakes, and security as motives for their moves. When these motivations are examined with respect to gender, the largest differences appear in work-related and family-related migration. While nearly one in two male migrants (47%) engaged in work-related moves, only about two in 10 female migrants (17%) did such moves. In contrast, more than half of the female migrants (56%) engaged in family-related moves, whereas about one-third of the male migrants (32%) did such moves. These gender differences in reported reasons for migration imply that the selection mechanisms that govern whether and where individuals migrate may vary by gender. In fact, it is possible that individual characteristics, such as ability, are more likely to determine males' migration behavior (resulting in work-related moves), whereas family and household characteristics are more likely to determine females' migration behavior (resulting in family-related moves). Therefore, evidence pointing to possible gen-

[4] However, as reported in table 1, for the 1995–2000 period, about 28% of migrants from the Marmara region moved to the three least developed regions (Black Sea, Southeastern Anatolia, and Eastern Anatolia). This finding provides evidence that, as explained in detail in the section on the data, individuals who moved across provinces within the 5-year period may include movers with different motivations, including first-time movers, repeat migrants, and return migrants. For instance, compared to other migration flows, the flow from most-developed region to least-developed region is more likely to involve return migrants. In this regard, while neither the census data nor any other data sets in Turkey enable researchers to fully account for the heterogeneity of individuals who had moved within the 5-year period, it should be taken into account when interpreting the estimation results presented in this study.

der differences in selection mechanisms that determine migration behavior provide a plausible reason for confining the analysis sample to male individuals in this study.

IV. Research Design

A. Data

The data used in this study come from the 1990 and 2000 Turkish censuses. I use a randomly drawn 5% sample from each year of the census data to estimate the causal effect of internal migration on natives' labor-market outcomes. The census data contain information on individuals' demographic characteristics, educational attainments, and labor-market outcomes.

The census data also provide information on the place of residence for all individuals who are older than age 5 at three different points in time: at birth, 5 years prior to the census, and at the time of the census. Using this information, I construct four categories to identify individuals' migration behavior and to measure the inflow rate of internal migration at the province level:

Natives: Those who were residing in the same province 5 years prior to the census and at the time of the census.

Recent internal migrants: Those who were residing in different provinces 5 years prior to the census and at the time of the census.

Permanent natives: Those who were residing in the same province at the three different points in time.

Old internal migrants: Those who were residing in the same place 5 years prior to the census and at the time of the census but who had a different birthplace.

By restricting the analysis sample to the noninstitutional population,[5] the first two categories are constructed based on information about individuals' mobility across provinces within the last 5 years prior to the census. In the empirical analysis, using information regarding individuals' last 5 years of mobility, I calculate the recent internal migrant–native ratio at the provincial level by dividing the total number of recent internal migrants by the total number of natives in a given province.[6] Furthermore, I split natives into two groups by matching information regarding their province of residence 5 years

[5] In particular, I excluded individuals who were residing in hospitals, health centers, military quarters barracks, garrisons, boarding schools, hostels, kindergartens, orphanages, nursing homes, prisons, reformatories, and other institutional residences, as well as individuals who were interviewed in hotels, motels, and pensions at the time of the census. I also excluded individuals who were passengers on trains, ferries, busses, etc. at the time of the census.

[6] To refer to the internal migrant–native ratio, I use two terms—the recent migrant–native ratio and the recent migrant ratio—interchangeably.

prior to the census with information on their birthplace: I define individuals whose information on provinces matched as permanent natives, and all remaining natives are grouped as old migrants.

Within such a definitional framework, recent migrants may represent a more mobile and heterogeneous group in the sense that they contain individuals with at least three different migration behaviors: (*a*) *first-time movers*: those who changed their province of birth for the first time in their life; (*b*) *return migrants*: those who returned to their province of birth; and (*c*) *repeat migrants*: those who changed their province of residence but whose origin and destination provinces are both different from their province of birth. Because the census provides information on only one move across provinces for a fixed time period (i.e., within the last 5 years prior to the census), it is not possible to differentiate these three migrant groups from each other. This information also does not enable us to identify individuals who changed their province of residence but were returning back to their original province within the 5-year interval and thus were recorded as natives in the census. As the time period in which individuals' migration behavior is measured becomes longer, such as the time interval between the period when an individual was born and the period when the census was conducted, it is more difficult to capture the full history of individuals' migration behavior. For example, while permanent natives are defined as the least mobile group in the definitional framework given above, many permanent natives may have changed their place of residence during their lifetime but were residing in their province of birth during the time periods that the census collected information for (current residence and residence at 5 years ago). Similarly, old migrants may include individuals who moved across provinces and then moved back to the origin province within the last 5 years prior to the census.

Moreover, it is important to note that while the census data may fail to capture heterogeneity in individuals' mobility, it also may measure their migration behavior with some errors, leading to an attenuation bias in the estimated effects. In particular, because the census collects retrospective information and, as noted above, records only one move for a fixed time period, the magnitude of measurement error might be greater for those who move multiple times and move across many places. Therefore, because the census data fail to furnish the necessary information to sort out these detailed and diverse aspects of individuals' migration experiences and because this study mainly estimates the effects of internal migration that are based on a rather narrow measure of individuals' 5-year mobility, additional care is warranted when interpreting the estimation results.

Using the administrative divisions of the 1990 and 2000 censuses, I identify

provinces for which I measure the association between the inflow of internal migrants and labor-market outcomes. However, because the Turkish Statistical Institute (TurkStat) includes only province and district codes, and not county and village codes for security and confidentiality reasons, it is difficult to identify provinces consistently across both census periods. Nevertheless, to take changes in the administrative divisions during the 1990–2000 period into account, and thus to be able to construct provincial-level 2-year panel data, I recode provinces and districts in the 2000 census based on the structure of the administrative divisions in the 1990 census. In addition, the places of residence that became districts during the 1990–2000 period are recoded for the 2000 census as rural residences within districts as they appeared in the 1990 census. Recoding provinces and districts results in a total of 73 provinces for both censuses.[7]

Furthermore, to strengthen the consistency of definitions of provinces and districts across census years, the sample analysis was restricted to individuals residing in the provinces and/or district centers at the time of the census, excluding rural places of residence.[8] This restriction also inhibits the possibility that estimates of internal migration would be contaminated by urban-rural differences in labor-market outcomes. In particular, because of the agricultural sector's unique characteristics, such as seasonal differences and high volatility in the agricultural production, the determinants of both labor supply and labor demand may exhibit noticeable differences between the rural and urban labor markets. In parallel to the nature of production in the agricultural sector, migrant flows to rural areas are likely to last for a short time and to be observed with higher frequencies, making it difficult to detect the possible labor-market effects of migrant inflows on migrant-receiving rural areas. Furthermore, the census data are not appropriate for measuring relatively more volatile, tran-

[7] A referee points out that because redistricting between 1990 and 2000 may occur in areas where there are increasing labor-market opportunities, recoding data may bias the estimation results. Since census data do not provide detailed residential information for rural settlements, it is impossible to evaluate whether estimation results obtained from the urban sample are robust to the exclusion of new district areas from the analysis sample. Nevertheless, when the full sample of urban and rural population is used, estimation results obtained from the data with and without recoding suggest that the estimated negative effects of the recent migrant ratio are not driven by removing new districts from the analysis sample. The estimation results of this empirical exercise are available upon request.

[8] As suggested by a referee, to determine whether the estimated effects for each migrant and native group are robust to the inclusion of the rural population, using the full sample that includes both urban and rural population, I reestimated specifications in tables 5 and 6. This empirical evidence indicates that the adverse estimated effect of the recent migrant ratio is robust regardless of whether the rural population is excluded. These results are not presented in this article for the sake of brevity, but they are available upon request.

sitory, and short-term population and employment movements that may reflect the characteristics of rural areas.

Similarly, to isolate gender differences in migration and labor-market outcomes from the estimation results, I solely focus on males' labor-market outcomes. Because the migration behavior of females is more likely than that of males to depend on both the migration and labor-market performances of other household members, the family or household is a more appropriate unit of analysis to uncover the causes and consequences of the female population's migration behavior (Mincer 1978). However, census data do not contain the information necessary to detect migration episodes that took place at the family or the household level. Furthermore, factors other than ability, wages, and employment opportunities may play more important roles in females' migration decisions, reducing the validity of the selection mechanism occurring at the individual level, whose effects on estimates of internal migration are controlled by the econometric methods implemented in this study. For example, among females, marriage-specific human capital and differences in the marriage market between origin and destination provinces may have more explanatory power for the joint determination of their migration and labor-market outcomes. In fact, as explained in detail in the background section, compared to female migrants, male migrants are more likely to engage in work-related moves and less likely to engage in family-related moves. A similar observation can be made regarding gender differences in selection mechanisms that determine labor market outcomes. Therefore, to control gender-based heterogeneities in both migration and labor market outcomes, the analysis sample is restricted to male individuals.[9] These two restrictions mean that I measure the intensity of the inflow of recent internal migrant at the urban level and examine the impact of this migrant inflow on the labor-market outcomes of urban male individuals.

To assess whether and to what extent recent internal migrants displaced native workers, I focus on the natives' employment ratio. In addition, I examine the natives' LFPR to take into account the relative size of the demographic groups that entered the labor market during the 1990–2000 period. The intensity of recent internal migration at the province level is obtained by dividing the number of working-age recent internal migrants by the number

[9] Nevertheless, when the analysis sample is confined to native females, as found for their male counterparts, the estimation results suggest that migrant inflows are negatively associated with native females' labor-market outcomes. The results of this analysis are available upon request.

of working-age natives, where "working age" is defined to encompass ages 16–64.

B. Econometric Methodology

To identify the possible causal effects of internal migration on natives' labor-market outcomes, I exploit changes in the shares of recent migrant between provinces during a 10-year period between 1990 and 2000. In the empirical labor literature, it has been well established that both individuals' migration and labor-market behavior are influenced by individual characteristics, such as education and age. To control for these associations and their differences across provinces, I use a two-stage estimation method, where its first stage, based on the individual-level observations, entails an estimation of the following equation for natives in each year of the census data:

$$W_{ijt} = X_{ijt}\gamma_t + Q_{ijt}\lambda_t + \varepsilon_{ijt}, \quad t = 1990 \text{ and } 2000, \tag{1}$$

where i indexes individuals, j indexes provinces, and t indexes time; W_{ijt} is the binary indicator of labor-market outcomes for individual i in province j at time t; and X_{ijt} is the vector of individual characteristics, including six dummies for educational attainment, cubic in age, and interactions between the two.[10] The vector Q_{it} has k (number of provinces) elements, such that Q_{ijt} is the binary indicator of whether individual i resides in province j in year t, γ_t and λ_t are vectors that denote period-specific parameters,[11] and ε_{ijt} denotes the stochastic error term.

In the first-stage estimation, the elements of λ_t capture the means of the period-specific, residual, province-level deviations of the labor-market outcomes, after removing the part that can be explained by the vector of individual characteristics. In the second-stage estimation, I use these estimated residual province-level deviations, λ_t, as the dependent variable in the following regression equation:

$$\hat{\lambda}_{jt} = \theta_0 + \theta_1 \mathrm{RM}_{jt} + S_{jt}\phi + \eta_j + v_{jt}, \tag{2}$$

where RM_{jt} represents the recent migrant ratio in province j at time t, measuring the working-age migrant population as the share of the working-age native population; S_{jt} represents the vector of province-level characteristics that

[10] Table A1 in the appendix depicts the descriptive statistics for the control variables used in the first-stage estimation of native and migrant males' labor-market outcomes.

[11] Because the estimates of the $k \times 1$ vector of λ_t (the coefficients of province dummies for each time period) will be subjected to the second-stage analysis, the constant term in eq. (1) is set to be zero.

may be related to province-level labor-market outcomes;[12] and ν_{jt} represents the province-level random error term.

Within such a framework, as η_j captures province-specific characteristics that could not only be observed by researchers but may also be important determinants of the size and quality of migrant population and labor-market opportunities for a given province, how it evolves over time shapes the nature of econometric problems in terms of both their contents and solutions that should be implemented in the empirical analysis carried out in the study. For instance, if η_j consists of only time-invariant, province-specific characteristics, applying a first-difference estimation method eliminates these province-level fixed characteristics, which may cause a spurious correlation between the recent migrant ratio and natives' labor market outcomes. For this reason, I first estimate equation (2) in first-differences:

$$\Delta\hat{\lambda}_j = \beta\Delta\mathrm{RM}_j + \Delta S_j\pi + \Delta\nu_j. \tag{3}$$

In the first-difference regression model, the coefficient of interest, β, measures the extent to which natives' outcomes between 1990 and 2000 differed between provinces with a greater inflow of recent migrants and those provinces that did not experience such a change. In addition to controlling for province-level fixed characteristics, the first-difference estimation method also makes it possible to control for shifts in natives' outcomes during the 1990–2000 period that occurred because of policy changes at the national level, such as economy-wide shocks that were common to all provinces.

However, besides time-invariant, province-specific characteristics, when η_j also contains transitory, temporary, random shocks that may affect both the recent migrant ratio and natives' outcomes at the provincial level, the first-difference estimation method fails to yield a consistent estimate of the recent migrant ratio's effect (Altonji and Card 1989; LaLonde and Topel 1997).[13] To

[12] Specifically, it includes the provincial average age, the logarithm of the ratio of the number of individuals with advanced education to the number of those with no education, the logarithm of the ratio of the number of individuals with intermediate education to the number of those with no education, and the logarithm of the province population. Table A2 in the appendix displays the descriptive statistics of these control variables used in the second-stage estimation of labor-market outcomes. Note that these control variables are included in all the regression models whose results are presented in the article.

[13] One example of such transitory and short-lived, province-specific changes is the 1999 Marmara earthquake that caused widespread destruction in northwestern Turkey, which had achieved the highest level of economic and social development in the country. When provinces hit by the earthquake were measured by the socioeconomic development index in 1996–about 3 years before the earthquake—and that measured in 2003—about 4 years after the earthquake—are compared, the observation that these provinces were able to improve or at least protect their relative position in the ranking of all provinces in terms of this index suggests that they were able to recover from the earthquake's devastating impacts within a short time.

address this problem, I apply an instrumental variable (IV) estimation method suggested by Altonji and Card (1989). Similar the the procedure of their study, I use the recent migrant ratio for the previous period, RM_{j1990}, as an instrumental variable for the change in the recent migrant ratio between 1990 and 2000, ΔRM_j. To implement this estimation strategy, two requirements must be satisfied. The first one requires that RM_{j1990} be closely related with ΔRM_j; that is, recent migrants are more likely to move to provinces where previous migrants are densely populated. As a second requirement, when ΔRM_j is included in the regression equation, as in equation (3), RM_{j1990} must be uncorrelated with the change in the stochastic error term, Δv_j; that is, the recent migrant ratio in 1990 can influence changes in the labor-market outcomes only by exclusively affecting changes in the recent migrant ratio. Provided that these requirements are satisfied, the first-difference instrumental variable (the first-difference-IV) estimator is a consistent estimator of the recent migrant ratio's effect on natives' labor-market outcomes.[14]

However, it is possible that during the 1990–2000 period, when important market-oriented reforms were introduced, along with the Turkish economy's integration into the world economy, some permanent changes may have taken place within provinces, invalidating the maintained identification assumption in the first-difference-IV estimation method. But, to the extent that these permanent changes within provinces did not alter the ranks of provinces in terms of their economic and social development, the relative measures of which are also key determinants of the direction of migrant flows, the identification strategy of the IV method may remain valid.

To assess the extent to which the ranking of provinces in terms of their economic and social development changed between 1990 and 2000, I calculate correlations between key province-level economic and social indicators measured in 1990 and those measured in 2000 when data are available. The high positive correlations between these indicators, ranging from 0.902 to 0.987, suggest that the rank ordering of economic and social development across provinces remained unchanged, providing support for the IV identification strategy.[15]

[14] I use weights to estimate all specifications. The square root of the number of the observations for the group of interest in the province is used as a weight to estimate the cross-sectional specification. As Altonji and Card (1989) suggest, the first-difference and the first-difference-IV specifications use $(N_{1990}^{-1} + N_{2000}^{-1})^{-1/2}$ as a weight, where N_{1990} and N_{2000} are the number of observations for the group of interest in the 1990 and 2000 census data.

[15] In particular, I calculate correlations for the following province-level variables between 2 specified years, and these calculated correlations are given in parentheses for each variable: GDP per capita, 1990–2001 (0.902); socioeconomic development index scores, 1996–2003

Nevertheless, there are other possible threats to the validity of the instrument used in the first-difference-IV specifications that are difficult to address because the census contains limited information on individuals' migration and labor-market outcomes. When the change in the recent migrant ratio is instrumented by the recent migrant ratio in 1990, the maintained assumption is that recent migrants are more likely to choose their destination provinces based on the stock of previous migrants in these locations. However, for example, if this positive correlation results from the fact that the recent and previous migrants share some common, unobservable characteristics that are also related to their migration and labor-market outcomes, the IV estimation might yield biased estimates. Because research on migrant networks provides causal evidence that the stock of previous migrants, in terms of both their size and quality, performs important functions in migrants' destination choices, as well as their labor-market success, this assumption seems to a plausible one to maintain throughout the analysis (Bartel 1989; Munshi 2003; Yamauchi and Tanabe 2008).

The other issue that may threaten the IV estimation's validity is the extent to which the recent migrant ratio in 1990 is correlated with the change in the recent migrant ratio. If this correlation is weak, then there might be the problem of weak identification, leading to biased IV estimates in the direction of ordinary least squares (OLS) estimates. When the Staiger-Stock (1997) rule indicating that for a single endogenous regressor the first-stage F-statistics must be larger than 10 to avoid the problem of weak instruments is applied, all IV specifications with one endogenous regressor and one instrument satisfy this requirement, suggesting that the results are not driven by the weak-identification problem.[16]

As a final issue, it is possible that individuals may move out of the province of residence to mitigate the adverse effects of labor supply shocks induced by an inflow of migrants. As argued in the international migration literature, because of the native population's out-migration, an identification strategy that relies on a spatial correlation between the inflows of migrants and labor-market outcomes across provinces may underestimate the impact of the inflows of migrants on natives' labor-market outcomes (Borjas 1994; LaLonde and Topel 1997). However, research on international migration provides mixed evidence for the presence of this possible mechanism through which the impacts

(0.986); share of value added in manufacturing industry, 1990–2002 (0.987); and bank deposits per capita, 1990–2000 (0.979).

[16] Furthermore, as Stock and Yogo (2003) suggested, when Cragg-Donald (1993) statistics are compared with their suggested critical values for specifications with two endogenous regressor and two instruments (specifications reported in table 8), the results suggest that the instruments may be adequate to identify the causal effects of internal migration.

of migrant flows are reduced by natives' movements to other areas with a lower migrant density within the country (Card and DiNardo 2000; Borjas 2003; Lewis 2004). Nevertheless, because internal migration involves more intense, two-way population movements between provinces, the impact of natives' out-migration on the estimates might be greater when the causal effects of the inflow of internal migrants are examined. Indeed, owing to the nature of internal migration, the same migrant is considered an in-migrant for some provinces and an out-migrant for other provinces, and likewise, the same province is considered as a province of origin for some migrants and as a province of destination for other migrants. These interdependencies make it difficult to model two different selection mechanisms that distinguish province-level and individual-level unobserved characteristics that separately govern in-migration and out-migration for a given province.

Moreover, neither the Turkish social, political, and economic context nor information contained in Turkish data sets enable us to make these selection mechanisms distinguishable. Therefore, because natives may out-migrate to lessen the adverse labor-market effects of the inflow of migrants, the estimation results obtained in this study should be considered as lower bounds of the effects of the inflow of internal migrants on individuals' labor-market outcomes. Nevertheless, as suggested by Kugler and Yuksel (2008), I add the old migrant-native ratio to the specifications to control for the possibility that some individual may move out to shelter themselves from the adverse labor-market consequences of migrant inflows. As shown below, the main estimation results are robust to the presence of such a possibility, which may lead the analysis to underestimate the adverse impacts of migrant inflows on natives' labor-market outcomes.

In the following section, I provide cross-sectional estimates for each year, as well as first-difference estimates and first-difference-IV estimates for natives' outcomes. Presenting the estimated effects of internal migration in this order makes it possible to detect the presence of biases in the estimated effects and, if they exist, to determine the direction of these biases. I also perform a similar analysis for permanent natives, old migrants, and recent migrants.

V. Econometric Results

A. Basic Results

Before discussing the estimation results, it is useful to discuss individuals' labor-market performances by their native-migrant statuses, as shown in table 2. The first thing to notice is that regardless of individuals' migrant-native status, they experienced declines in their labor market performance in the 2000 census compared to those in the 1990 census. Given that these declines in

TABLE 2
DESCRIPTIVE STATISTICS OF MALE INDIVIDUALS' LABOR-MARKET OUTCOMES BY MIGRANT STATUS: 1990 AND 2000 CENSUSES

	Labor Force–Population Ratio			Employment-Population Ratio		
	1990	2000	Change	1990	2000	Change
Natives	.829	.786	−.043	.732	.608	−.124
	(.376)	(.410)		(.443)	(.488)	
Permanent natives	.825	.769	−.056	.710	.568	−.142
	(.380)	(.421)		(.454)	(.495)	
Old migrants	.837	.815	−.022	.771	.675	−.096
	(.370)	(.388)		(.420)	(.469)	
Recent migrants	.869	.809	−.060	.790	.672	−.119
	(.337)	(.393)		(.407)	(.470)	

Note. In both the native group and the migrant group, the sample of analysis is restricted to the male, working-age population of ages 16–64. See the text for detailed information on the definitions of the two groups. Standard deviations are reported in parentheses.

labor-market outcomes are consistent with those calculated at the national level using Turkish Household Labor Force Surveys, where there is no information on individuals' migrant-native status, the sharp recession of 1999 and the earthquake in the same year (which hit the Marmara region where most labor-market opportunities are concentrated) may account for the deterioration of each group's labor-market performance during the 1990–2000 period (Tunalı 2003). The finding that decreases in LFPRs are smaller than those in employment ratios suggests that some individuals who lost their jobs because of these adverse shocks were still looking for work, thereby reducing the negative effects of these shocks on LFPRs. The observed differences between these two labor-market outcomes and their corresponding explanation are persistent throughout the analysis below, where I estimate the impact of the inflow of migrants on individuals' labor-market outcomes.

As reported in table 2, for both census years, the comparison of labor market outcomes between different migrant and native groups does not reveal noticeable changes over time. For example, when natives and recent migrants are compared, it appears that both groups did not differ significantly in their labor-market performance across census years. Likewise, when natives are broken down into two different groups (i.e., permanent natives and old migrants), although both recent and old migrants seem to perform slightly better than permanent natives, these differences are not statistically significant.

I begin the empirical analysis by estimating the effects of the recent migrant ratio on labor-market outcomes for male natives who did not move to a different province within the last 5 years prior to the census. As shown in table 3, unlike the cross-sectional estimates, the first-differences estimation model yields a negative relation between the recent migrant ratio and the native's

TABLE 3

ESTIMATED EFFECTS OF THE RECENT MIGRANT–NATIVE RATIO ON NATIVE MALES' LABOR-MARKET OUTCOMES

	Labor Force–Population Ratio				Employment-Population Ratio			
	Cross Section, OLS, 1990	Cross Section, OLS, 2000	First Difference	First Difference, IV	Cross Section, OLS, 1990	Cross Section, OLS, 2000	First Difference	First Difference, IV
Recent migrant–native ratio	.145**	.355***	−.220**	−.354	.373***	.586***	−.454*	−1.714***
	(.056)	(.065)	(.105)	(.223)	(.097)	(.139)	(.236)	(.593)
Log (advanced/no education)	−.023**	−.026***	−.038	−.027	−.074***	−.083***	−.120**	−.014
	(.009)	(.007)	(.023)	(.029)	(.016)	(.015)	(.054)	(.078)
Log (intermediate/no education)	−.001	−.007	.016	−.020	.089***	.143***	.246***	.283***
	(.012)	(.009)	(.034)	(.034)	(.021)	(.020)	(.077)	(.093)
Mean age/100	.211	.023	1.026**	.793	1.387**	1.584***	3.53***	1.334
	(.317)	(.246)	(.470)	(.586)	(.552)	(.523)	(1.06)	(1.56)
Log (province population)	−.002	.011***	.028	.012	.014***	.030***	−.010	−.162*
	(.002)	(.001)	(.023)	(.033)	(.004)	(.003)	(.052)	(.089)
R^2	.332	.556	.473	.460	.633	.880	.389	.131
F-statistic for the instrument in the first stage: recent migrant–native ratio in 1990				19.69				19.69

Note. For each specification, $N = 73$, the number of provinces in the data after recoding provinces in the 2000 census based on their administrative categories in the 1990 census. All specifications are weighted. See the text for details. To save space in the following tables, the *F*-statistic for the instrument in the first-stage recent migrant–native ratio is abbreviated as the first-stage *F*-statistic. Standard errors are in parentheses.

* Significantly different from zero at the 10% level.

** Significantly different from zero at the 5% level.

*** Significantly different from zero at the 1% level.

LFPR. At the province level, a small increase in the recent migrant ratio leads to a 0.22 percentage-point reduction in the change in the LFPR, and this estimated effect is significant. I also implement the first-difference-IV estimation method as an alternative strategy to take into account the possibility that changes in the recent migrant ratio within provinces are endogenously determined, thereby controlling for the effects of possible province-level temporary shocks on the estimated effect of the recent migrant ratio. The first-difference-IV estimate remains negative, but it is not significant at conventional levels.[17]

As a second labor outcome for male natives, I examine the employment ratio in table 3. As observed for the LFPR, cross-sectional estimates provide evidence for a strong, positive relation between the recent migrant ratio and the employment ratio. However, the first-difference and the first-difference-IV regression models reverse the sign of the relation between the two variables, providing evidence for the presence of recent migration's adverse effect on native males' employment outcomes. In particular, the first-difference estimate suggests that a small increase in the recent migrant ratio is associated with a 0.454 percentage-point decrease in the change of the employment ratio; the first-difference-IV estimate is −1.714, about three times the first-difference estimate.[18] These estimated effects are significant at conventional levels.

When I evaluate the estimations obtained in this section, two main results emerge. First, similar to findings reported in the international migration literature, the evidence that the first-difference estimation reverses the positive correlation between the inflow of recent migrants and natives' labor-market outcomes suggests that individuals are sorted into provinces with greater labor-market opportunities. Second, I provide evidence for the empirical importance of two sources of bias that may contaminate the first-difference estimates. As the first source of bias, the measurement error associated with the calculation of migrant population densities for provinces, and the aggravation of this problem when using changes in these densities over time, may bias down the estimated effects toward zero. In addition, because individuals are likely to be attracted to provinces with favorable current economic environments and positive temporary shocks, the estimated negative effects may be further biased down. As reported in table 3, evidence that the first-difference-IV estimates are greater than their first-difference counterparts confirms that both positive

[17] Note that conventional levels include significance levels at 1%, 5%, and 10%.

[18] I also calculate the natives' labor-market outcome elasticity to make the estimation results more accessible. Implied elasticities from the first-difference-IV specification indicate that a small increase in the recent migrant ratio is estimated to reduce the change of employment ratio by 34%; it also lowers the change in the LFPR by 20%.

selection biases and measurement error may lead to an underestimation of the adverse effects of internal migration on natives' labor-market outcomes.

Using these estimation results for both labor-market outcomes, the relation between the unemployment ratio and the recent migrant ratio can be inferred.[19] Specifically, given that the difference between the LFPR and the employment ratio yields the unemployment ratio, the evidence that the influx of migrants may cause a larger decline in the employment ratio than the LFPR suggests that the unemployment ratio may increase more in the provinces that experienced higher migrant inflows relative to those who did not during the 1990–2000 period. Because, compared to other labor-market measures, there are well-established difficulties associated with the measurement of the unemployment ratio and, because, compared to labor force and household surveys, the census has its own disadvantages in detecting individuals' detailed labor-market activities, I confine the discussion in this study to the effects of internal migration on both the LFPR and the employment ratio.

In this framework, because changes in the employment ratio may capture variations in labor demand, the evidence of a negative association between this ratio and the recent migrant ratio implies that recent migrants may displace native male workers. A similar but weaker estimated negative effect for the LFPR indicates that the effect of the recent migrant ratio may be lessened but not fully offset by an increase in those displaced native workers who might stay in the labor force and look for a job or by an increase in natives who were either new labor-market entrants or who were previously out of the labor force but are now looking for a job, or by both such groups.

B. Heterogeneity in the Estimated Effects by Natives' Skills: Education and Age

In this section, I further investigate whether and to what extent the causal effect of internal migration varies with native males' skills, measured by their educational level and age. When the analysis is confined to determine how the estimated effects of the recent migrant ratio evolves with natives' educational level, I assign individuals to three different education groups that reflect their skill levels: individuals without a primary-school degree are defined as the "no education group"; individuals with a primary- or middle-school degree are defined as the "intermediate education" group; and individuals with a high school diploma or a university degree are defined as the "advanced education group."[20]

[19] I am thankful to a referee for drawing my attention to this interpretation of the estimation results.

[20] Such a crude classification of an individual's education level is dictated by the limited content of the census data that contain only information about the highest level of educational degree conferred to an individual. It is also worthwhile to note that pre-tertiary education

In general, for both labor-market outcomes, comparing differences between the cross-sectional, first-difference, and first-difference-IV estimates in table 4 makes more apparent that recent migrants are sorted into provinces where unobserved characteristics are positively correlated with native males' employment outcomes. For each level of native males' skill, this positive-selection mechanism may cause a positive bias in the estimated effects of the recent migrant ratio, reducing the negative effects of internal migration. When attention is confined to the relation between the recent migrant ratio and the employment ratio, even though differences in the estimates across skill groups are not statistically significant, it appears that the negative effects of migrant inflows are felt by each skill group of natives, with the least effect on those with no education and the most effect on those with advanced education. In addition, the negative association between the LFPR and the recent migrant ratio is weakened to a great extent with different skill levels, except for those with advanced education. Indeed, the estimated effect is negative and significant only for natives with advanced education, where this skill group includes high school graduates, 2- and 4-year university graduates, and those with advanced degrees, such master's or doctoral degrees.[21] For this reason, it is noteworthy that, particularly for those with advanced education, it is rather difficult to provide causal explanations regarding the estimated effects because as a skill group individuals with advanced education may represent a diverse group of individuals in terms of both the quantity and the quality of education they received.[22] This difficulty might be compounded with the limited content of the census data and the absence of other data sources with both individuals' migration and labor-market behavior and published studies regarding the issue examined here. Nevertheless, in the proceeding analysis, I disaggregate the recent migrant ratio's estimated effects with respect to natives' age to provide some suggestive explanations that may account for differences in the estimated effects across educational levels.

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in Turkey had consisted of primary school, middle school, and high school education until 1997, when, because of the extension of the length of compulsory education from 5 to 8 years, it transformed into a two-tier system that contains (i) combined primary school and middle school education and (ii) high school education.

[21] Note that because the 1990 census data do not differentiate 2- and 4-year university graduates, as well as those with advanced degrees, in the empirical analysis they are all classified with high school graduates in a single skill group, which is referred to as "individuals with advanced education."

[22] It is also possible that education as a measure of skill may not fully capture the dynamics of substitution and complementarity in the province-level labor market. Furthermore, the province-level analysis may mask shifts within and across industries and occupations that are responses to a labor-market shock caused by the inflow of migrants in a given province.

TABLE 4

ESTIMATED EFFECTS OF THE RECENT MIGRANT–NATIVE RATIO ON NATIVE MALES' LABOR-MARKET OUTCOMES BY EDUCATIONAL GROUPS

	Labor Force–Population Ratio				Employment-Population Ratio			
	Cross Section, OLS, 1990	Cross Section, OLS, 2000	First Difference	First Difference, IV	Cross Section, OLS, 1990	Cross Section, OLS 2000	First Difference	First Difference, IV
A. Natives with no education:								
Recent migrant–native ratio	.293*	.728***	−.426	.179	.754***	.712***	−.868**	−1.447*
	(.162)	(.164)	(.264)	(.589)	(.206)	(.185)	(.407)	(.885)
First-stage *F*-statistic				18.64				18.64
B. Natives with intermediate education:								
Recent migrant–native ratio	.134*	.306***	−.154*	.050	.330***	.512***	.359	−1.602***
	(.605)	(.071)	(.089)	(.190)	(.103)	(.154)	(.237)	(.593)
First-stage *F*-statistic				19.52				19.52
C. Natives with advanced education:								
Recent migrant-native ratio	.074	.307***	−.286*	−.983**	.288***	.618***	−.445***	−1.695***
	(.057)	(.113)	(.163)	(.379)	(.072)	(.157)	(.227)	(.565)
First-stage *F*-statistic				20.58				20.58

Note. See the note to table 3. The no education group contains individuals without a primary school degree, the intermediate education group includes individuals with a primary school or a middle school degree, and the advanced education group contains individuals with a high school diploma or higher. Standard errors are in parentheses.

* Significantly different from zero at the 10% level.

** Significantly different from zero at the 5% level.

*** Significantly different from zero at the 1% level.

Consequently, in the second part of the heterogeneity analysis of the estimation results, I investigate to what extent the impacts of migrant inflows differ according to native males' age, along with their educational level. This investigation has three main objectives. First, finding similar evidence that establishes a negative association between the inflow of migrants and natives' labor-market outcomes for individuals in different stages of their life cycle may bolster confidence in both the estimation method and its results. Furthermore, as is done for educational groups, differentiating natives with respect to age groups may permit us to evaluate the skill-level heterogeneity in the estimated effects of the recent migrant ratio, where individuals' skill levels are measured by their age, reflecting their labor-market experiences.

Second, to the extent that an individual's age is negatively related to the propensity to migrate, this analysis may provide an assessment of the hypothesis that, compared to their younger peers, older individuals are more vulnerable to local labor-market shocks induced by higher migrant inflows. Indeed, as shown in table A1 in the appendix and documented in the migration literature, individuals tend to move between places in the early period of their working careers so that they can reap the returns to investments that they made in their migration moves for a longer period of time. At the same time, as older individuals might have accumulated more origin-specific human capital with the passage of time, the cost of moving to another place is expected to be higher for them than for younger individuals. Thus, in an attempt to mitigate the adverse labor-market consequences of higher migrant inflows, younger individuals may move to places with no such labor-market shocks, lessening the migrant ratio's negative estimated effects on their labor-market outcomes.

Third, simultaneously breaking down the estimated effects with respect to both natives' education and age may enable us to provide some evidence in favor of the presence of both age- and education-specific responses to an increase in migrant inflows. For instance, during the influx of migrants, instead of looking for a job or working at a job, younger individuals may opt to attend school or job-related training programs, while older individuals may leave the labor force to retire. More importantly, as suggested by the evidence below, these two labor-market behaviors may be more relevant for individuals with a higher level of education than for their peers with a lower level of education.

For native male individuals, results of efforts to determine how the recent migrant ratio's estimated effects vary across different age groups are given in table 5. As observed for all native males in the working-age population (ages 16–64), the first-difference-IV estimates imply that, for each age group, the negative estimated effects of the recent migrant ratio are more pronounced for the employment ratio than for the LFPR. Furthermore, it appears that the

TABLE 5

ESTIMATED EFFECTS OF THE RECENT MIGRANT RATIO ON LABOR MARKET OUTCOMES BY AGE

	Labor Force–Population Ratio				Employment-Population Ratio			
	Cross Section, OLS, 1990	Cross Section, OLS, 2000	First Difference	First Difference, IV	Cross Section, OLS, 1990	Cross Section, OLS, 2000	First Difference	First Difference, IV
A. Natives ages 16–24:								
Recent migrant–native ratio	.421***	.712***	.069	.044	.899***	1.067***	−.187	−.778*
	(.071)	(.127)	(.145)	(.275)	(.160)	(.175)	(.225)	(.448)
First-stage *F*-statistic				22.90				22.90
B. Natives ages 25–34:								
Recent migrant–native ratio	.054**	.177***	−.094	−.183	.360***	.708***	−.370	−2.06***
	(.023)	(.053)	(.070)	(.144)	(.090)	(.185)	(.292)	(.722)
First-stage *F*-statistic				19.50				19.50
C. Natives ages 35–44:								
Recent migrant–native ratio	.024	.156***	−.131	−.534***	.131**	.404***	−.296	−2.374***
	(.032)	(.053)	(.089)	(.210)	(.065)	(.142)	(.266)	(.748)
First-stage *F*-statistic				18.59				18.59
D. Natives ages 45–54:								
Recent migrant–native ratio	.047	.345**	−.719***	−.842	.100	.285*	−.815***	−1.531***
	(.154)	(.171)	(.263)	(.553)	(.157)	(.172)	(.282)	(.619)
First-stage *F*-statistic				17.69				17.69
E. Natives ages 55–64:								
Recent migrant–native ratio	−.004	.452**	−1.248***	−1.602***	−.024	.292*	−1.144***	−2.292***
	(.227)	(.192)	(.361)	(.743)	(.224)	(.172)	(.360)	(.765)
First-stage *F*-statistic				18.98				18.98

Note. See the note to table 3. Standard errors are in parentheses.

* Significantly different from zero at the 10% level.

** Significantly different from zero at the 5% level.

*** Significantly different from zero at the 1% level.

estimated effects of the recent migrant ratio exhibit age-specific patterns. As stated above, for younger individuals there are two possible predictions, working in opposite directions. In the first prediction, because the net benefit of migrating is relatively higher for younger individuals, they are more likely to move across provinces to nullify the negative consequences of migrant inflow, reducing its estimated negative effects. In contrast, the second prediction states that, as a result of such inflows, diminishing labor-market opportunities may lead younger individuals, particularly those ages 16–24, to go back to school or attend training programs. Accordingly, the negative estimated effects of the recent migrant ratio are expected to be greater for the labor-market outcomes of younger individuals, especially for their labor force–participation behavior. When the first-difference-IV estimates reported in panels A–E in table 5 are evaluated, it seems that, for the LFPR, the former dominates the latter, suggesting that the recent migrant ratio's estimated negative effects are greater for older native males than for their younger peers. Such a positive association between adverse consequences of migrant inflows and natives' age is observed for the employment ratio as well.

Furthermore, as suggested above, it is possible that, among all age groups, the 55–64 age group is most likely to exit the labor force by retiring as a response to any negative shock occurring in a given local labor market. In this regard, as reported in panel E of table 5, the finding that the negative association between the recent migrant ratio and the LFPR appears strongest for those in the 55–64 age group provides supporting evidence that individuals who are close to retirement age may choose to retire in response to the negative labor-market consequences of migrant inflows. This finding is also consistent with the fact that because the net benefit obtained from migration moves may decline with age, older individuals become less mobile, exacerbating the estimated negative effects of migrant inflows on both their employment ratio and LFPR.

When evaluated together, the estimation results reported in tables 4 and 5 demonstrate that the negative effects of an increase in the rate of migrant inflows are not uniformly distributed across native males' ages or educational levels, which are considered the most important determinants of individuals' labor-market outcomes. In addition to these analyses, I execute an empirical investigation at a more refined level, where the interactions between native males' age and educational level can be taken into account in estimating the effects of the recent migrant ratio on their labor-market outcomes. In addition to restricting the analysis sample to those who are males and natives, simultaneously clustering the sample further with respect to five age groups and three educational groups may make it difficult to have a sufficient number of observations for each unit of analysis (15 cells). To avoid this problem, as

shown in table 6, for each educational level, I classify native males into the three broader age groups: 16–34, 35–49, and 50–64.

Adopting such a classification, I implement the two-stage estimation method used throughout the study to obtain the first-difference and the first-difference-IV estimation results for these three age groups with the specified educational qualification.[23] In general, the results reported in panels B, C, and D of table 6 are in line with those reported in panel A of the same table and tables 4 and 5. Specifically, while the negative estimated effects of the recent migrant ratio remains greater for the employment ratio than for the LFPR, it appears that this negative association between the recent migrant ratio and native males' labor-market outcomes may simultaneously increase with their education and age. For instance, when the magnitudes of the negative estimated effects are sorted in ascending order, the negative labor-market consequences of migrant inflows are least felt by those aged 16–34 with no education and most felt by those aged 50–64 with advanced education. Given the migration literature's established empirical findings that individuals' migration propensities are negatively related to age and positively associated with education,[24] the estimated effects of the recent migrant ratio are expected to be lower for younger and/or more educated individuals because these individuals may cope with a negative shock in a local labor market by moving to new places where they can secure labor-market prospects with greater confidence. Although evidence obtained in this study confirms the prediction regarding how the estimated effects of the recent migrant ratio may change with age, it does not lend support to the prediction regarding how the estimated effects of the recent migrant ratio differ by educational level. When evaluating these differences in the estimated effects, it is important to consider the fact that education groups, particularly the advanced education group, include individuals with different educational degrees, such as a high school diploma or a 2- or 4-year university degree, where both the quantity and the quality of education may differ dramatically across and within each degree. Therefore, although findings that suggest differences in the estimated effects with respect to native males' age and educational level must interpreted with caution, they deserve further attention in future studies.

Related to the estimation results discussed above, further processing infor-

[23] Alternatively, I replicated this empirical exercise by using the same five age groups constructed previously, along with two broader educational categories: (i) natives with no education or intermediate education and (ii) natives with advanced education. The recent migrant ratio's estimated effects remained the same. The results are available upon request.

[24] See, e.g., Sjaastad (1962), Schwartz (1976), and Mincer (1978) for the migration literature regarding how individuals' education and age may influence their migration behavior.

TABLE 6

ESTIMATED EFFECT OF THE RECENT MIGRANT RATIO ON NATIVE MALES' LABOR-MARKET OUTCOMES BY EDUCATIONAL AND AGE GROUPS

	Labor Force–Population Ratio			Employment-Population Ratio		
	First Difference	First Difference, IV	First-Stage *F*-statistic	First Difference	First Difference, IV	First-Stage *F*-statistic
A. All natives:						
Ages 16–34	−.010	−.064	21.02	−.277	−1.422***	21.02
	(.091)	(.179)		(.238)	(.542)	
Ages 35–49	−.220**	−.555**	18.41	−.373	−2.086***	18.41
	(.107)	(.236)		(.241)	(.660)	
Ages 50–64	−1.121***	−1.435**	18.32	−1.133***	−1.965***	18.32
	(.317)	(.660)		(.310)	(.662)	
B. Natives with no education:						
Ages 16–34	.164	.915	17.03	−.006	.697	17.03
	(.320)	(.709)		(.517)	(.115)	
Ages 35–49	−.209	.596	17.85	−.256	−1.125	17.85
	(.350)	(.759)		(.448)	(.961)	
Ages 50–64	−.622	−.634	20.52	−1.122***	−1.708**	20.51
	(.418)	(.827)		(.421)	(.846)	

C. Natives with intermediate education:						
Ages 16–34	.008	.277*	20.73	−.254	−1.346**	20.73
	(.076)	(.163)		(.254)	(.566)	
Ages 35–49	−.163	−.407*	18.64	−.312	−2.144***	18.64
	(.109)	(.232)		(.277)	(.732)	
Ages 50–64	−.954***	−1.472**	18.27	−1.077***	−1.921***	18.27
	(.325)	(.686)		(.314)	(.684)	
D. Natives with advanced education:						
Ages 16–34	−.131	−.850**	21.89	−.242	−1.521***	21.89
	(.194)	(.411)		(.261)	(.588)	
Ages 35–49	−.278**	−.984***	18.25	−.527**	−2.254***	18.25
	(.129)	(.322)		(.223)	(.635)	
Ages 50–64	−2.162***	−2.975***	19.65	−2.049***	−2.746***	19.65
	(.526)	(1.077)		(.513)	(1.041)	

Note. See the note to table 3 for general information and the note to table 4 for definitions of the educational groups. Standard errors are in parentheses.
* Significantly different from zero at the 10% level.
** Significantly different from zero at the 5% level.
*** Significantly different from zero at the 1% level.

mation given in table 6 on how the recent migrant ratio's estimated effects vary with native males' age and educational level may provide avenues to evaluate the extent to which some common changes in labor-market behaviors, particularly labor force participation behavior, during any given local labor-market shock may also be observed in the occurrence of an influx of migrants in a local economy. One such common response among relatively younger individuals to depressing local labor-market opportunities may be to leave the labor force to go back to school or receive additional training. As documented in the labor literature, because education and further schooling and training are positively related, such responses are expected to appear more strongly for younger individuals with a higher level of education than their less educated peers. Indeed, a comparison of the estimation results obtained for native males in the 16–34 age group across panels B, C, and D in table 6 provides evidence in favor of this prediction. Indeed, within the younger population, the negative effects of the recent migrant ratio on the LFPR are estimated to be the largest for those with advanced education.

In the aftermath of a local labor-market shock, another widely observed response in labor force participation concerns individuals at the opposite end of the age distribution: in our case, native males in the 50–64 age group. As suggested previously, to cope with a negative labor-market shock induced by an influx of migrants, older individuals may speed up their exit from the labor force. In this regard, given the fact that education is an important determinant of being covered by the Turkish social security system, when migrant inflow reduces local labor-market opportunities, individuals with advanced education who are close to the retirement age may be more likely than their counterparts in the same age group with less education or those younger with the same level of education to be retired, contributing to a greater drop in the LFPR. As can be inferred from the last three panels of table 6, this prediction is confirmed empirically when native males aged 50–64 with advanced education are compared with those who are in the same age group but with different education qualifications and those who are in the same education group but a different age group. Of course, the explanations suggested here do not necessarily rule out other possible mechanisms that may account for differences in the recent migrant ratio's estimated effects. For this reason, future research should be conducted to uncover all mechanisms through which migrant inflows might alter the labor outcomes of individuals with different skill levels–that is, different age-education groups–by using data disaggregated at a fine level,

such as industry or occupation, measures that would better reflect individuals' labor-market experiences.[25]

C. Estimated Effects for Other Groups of Natives and Migrants

When I group individuals as natives and recent migrants, I exploit information on individuals' mobility across provinces within the last 5 years prior to the census. In this context, natives who were residing in the same place 5 years prior to the census also include individuals who migrated to a given province before 5 years prior to the census. I define these individuals as old migrants. Conversely among natives, those who reported having the same place of residence at the census time, 5 years prior to the census, and at birth are defined as permanent natives. It is important to make this distinction because whether and to what extent recent migrants share the same skills as different migrant and native groups in migrant-receiving provinces may determine the direction and magnitude of the effects of the inflow of recent migrants for these groups' labor-market outcomes. For example, because recent migrants are most likely to be alike in terms of their skills and motivations, they are also most likely to compete with other recent migrants. Thus, the estimated effect of the recent migrant ratio is expected to have the greatest impact on the labor-market outcomes of recent migrants. Using this same line of reasoning, because old migrants are more likely than permanent natives to share the same skills with recent migrants, the estimated effects may be greater for old migrants than for permanent natives.

However, there might be another mechanism that reverses this ranking of the order of the expected estimated effects for different migrant and native groups.[26] As a result of her move, if a recent migrant makes an unsuccessful job-location match or is faced with a negative employment shock, she has greater incentives than individuals in other migrant and native groups to remigrate until a better matching outcome is realized. Because recent migrants recently incurred the cost of migration and have accumulated more migration-specific human capital, such as information for labor-market opportunities and

[25] In a previous version of the article, I also differentiated the estimated effects with respect to recent migrants' skill, as well as those of native males. For native males, regardless of their skill level, the estimated effects of the high-skilled recent migrant ratio are found to be positive, whereas those of the low-skilled recent migrant ratio are negative. The estimated effects are not estimated precisely enough to reach a definitive conclusion, however. These results are available upon request.

[26] I am thankful to a referee for drawing my attention to some other possible mechanisms that may account for the heterogeneity in the estimated effects by individuals' migrant-native status.

migrant densities across alternative destinations, they are more likely to remigrate in response to unfavorable labor-market outcomes that are a result of either a higher recent migrant inflow or a poor job-location match. Indeed, as explained in the data section, because the recent migrant group also includes at least some of both repeat and return migrants, it is possible to observe that when experiencing poor labor-market prospects in a given destination's local labor market, individuals are more likely to return to their places of origin (return migrants) or are more likely to move onward to new places (repeat migrants) to secure their economic well-being. Furthermore, regardless of their initial migrant-native status, individuals with adverse labor-market outcomes are likely to migrate to improve their labor-market outcomes, and thus they are observed as recent migrants in the analysis sample. Thus, if these are influential, valid channels at work, then the adverse effect of the recent migrant ratio is expected to be the lowest for recent migrants' labor-market outcomes. Similarly, considering that old migrants moved to their current province of residence before 5 years prior to the census, where they have chosen to reside may have been an optimal solution to their job-location matching problem, mitigating the effects of past adverse labor-market shocks, as well as those of the anticipated future labor-market shocks, such as the inflow of recent migrants to their province of residence. For this reason, the effects of a recent migrant ratio may be lower for old migrants' labor-market outcomes than are those of permanent natives.

To evaluate these two competing, alternative explanations of how migrant and native groups responded differently to the labor-market shock induced by an inflow of recent migrants, I ran employment regression models for each group, and I present the estimated results in table 7. In general, the results suggest that, when explaining the heterogeneity in the estimated effects of the recent migrant ratio by different migrant and native groups, the fact that migration may serve as a means to make a better job-location match and to mitigate the adverse effects of labor-market shocks may play more important roles than the effects of substitution and complementarity between different migrant and native groups. When the analysis is confined to the first-difference-IV estimates for the employment ratio, of these three distinct groups, the strongest adverse effects of the recent migrant ratio emerge for the permanent native males' employment ratio. Furthermore, as shown in panel D of table 7, the first-difference-IV estimates suggest that the weakest negative association between the recent migrant ratio and the employment ratio is observed for recent migrants. A similar order of the estimated effects is not observed for the LFPR, whose estimated effects remain negative but statistically insignificant.

TABLE 7

ESTIMATED EFFECTS OF THE RECENT MIGRANT–NATIVE RATIO ON LABOR-MARKET OUTCOMES BY MIGRANT STATUS

	Labor Force–Population Ratio				Employment-Population Ratio			
	Cross Section, OLS, 1990	Cross Section, OLS, 2000	First Difference	First Difference, IV	Cross Section, OLS, 1990	Cross Section, OLS, 2000	First Difference	First Difference, IV
A. Natives:								
Recent migrant–native ratio	.145**	.355***	−.220**	−.354	.373***	.586***	−.454*	-1.714***
	(.056)	(.065)	(.105)	(.223)	(.097)	(.139)	(.236)	(.593)
First-stage *F*-statistic				19.69				19.69
B. Permanent natives:								
Recent migrant–native ratio	.208***	.396***	−.131	−.162	.514***	.748***	−.309	-1.774**
	(.063)	(.072)	(.11)	(.252)	(.111)	(.15)	(.253)	(.714)
First-stage *F*-statistic				15.58				15.58
C. Old migrants:								
Recent migrant–native ratio	.063	.202***	−.034	−.073	.143	.167	−.19	-.870**
	(.056)	(.076)	(.126)	(.254)	(.089)	(.123)	(.199)	(.435)
First-stage *F*-statistic				21.79				21.79
D. Recent migrants:								
Recent migrant–native ratio	.241***	.712***	−.432**	−.395	.301***	.819***	-.457**	−.624
	(.061)	(.166)	(.183)	(.424)	(.096)	(.188)	(.188)	(.439)
First-stage *F*-statistic				21.79				21.79

Note. See the note to table 3. The analysis sample is restricted to permanent natives, old male migrants, and recent male migrants in each panel. Standard errors are in parentheses.

* Significantly different from zero at the 10% level.

** Significantly different from zero at the 5% level.

*** Significantly different from zero at the 1% level.

D. Robustness of the Estimation Results to the Inclusion of the Old Migrant Ratio

In addition to positive selection biases and measurement errors, the estimated effects of the recent migrant ratio may also suffer from specification error, because, in part, of the omitted term in the specifications. One possible candidate for the omitted term is a stock of previously migrated individuals–old migrants–which may be considered as a measure of the migrant network in a given province. The spatial distribution of old migrants may be closely related to those of new arrivals—recent migrants—and their labor-market success (Bartel 1989; Munshi 2003; Yamauchi and Tanabe 2008). In particular, migrant networks may provide assistance in migration and resettlement, reducing migration costs. Furthermore, such networks may increase the expected benefits of migration for potential migrants by providing information on job opportunities, acquisition of skills, and other employment-related resources. Therefore, serving as social capital, migrant networks may boost both recent migrants' inflow and their labor-market success in a given province. This means that the presence of old migrants may create an environment where recent migrants are equipped more rapidly and efficiently to compete with natives for labor-market opportunities in the province labor market.

Therefore, in this framework where the old-migrant ratio is considered as a measure of the migrant network for a given province, omitting this term from specifications may bias the negative effects of the recent migrant ratio on natives' labor-market outcomes. To assess the presence and direction of this type of bias in the estimated effects, I reran the specifications in table 7 by including the old migrant-native ratio, and I present the estimation results for the augmented specifications in table 8. In the first-difference-IV specification, changes in both the recent and the old migrant–native ratios that occurred between 1990 and 2000 are instrumented by their respective ratios in 1990.

Compared to those reported in table 7, the estimation results in table 8 provide evidence that including the old migrant ratio in the first-difference-IV specifications heightens the adverse effects of the recent migrant ratio on labor-market outcomes for each migrant and native group, as well as their statistical significance levels. Specifically, when the employment ratio is examined, while the estimated effects increase for natives, permanent natives, and old migrants, they become statistically significant for recent migrants. A similar observation is also made for the LFPR, except that the estimated effects are not statistically significant for old migrants.

Furthermore, specifications in table 8 enable me to probe the presence of a channel through which individuals may move out of the province of residence to mitigate the adverse effects of a labor-market shock caused by the inflow of migrants, thereby weakening the negative estimated effects of the recent

migrant ratio on natives' labor-market outcomes. Because to some extent, by definition, the old migrant population captures the size of the immobile population in the province for the last 5 years prior to the census, including the old migrant–native ratio in specifications also controls for the local population's out-migration propensities induced by recent migrant inflows. The robustness of the recent migrant ratio's estimated effects reported here rules out the presence of such a channel, which may lessen the adverse impacts of migrant inflows on natives' labor-market outcomes.

The specifications in table 8 also enable me to examine the estimated effects of the old migrant–native ratio on labor-market outcomes. Unlike the recent migrant ratio, the estimated coefficients of the old migrant ratio are only statistically significant and negative for the permanent natives' LFPR and the old migrants' LFPR and employment ratio. The findings for the latter group suggest that old migrants are likely to share similar skills with other old migrants, thus reducing their labor-market opportunities. More importantly, the statistically insignificant but negative association between the old migrant ratio and recent migrants' labor-market outcomes suggest that a higher density of old migrants in a given province does not improve recent migrants' labor-market success. Furthermore, the adverse estimated effects of the old migrant ratio are weaker than those of the recent migrant ratio for each migrant-native group's labor-market outcomes. When evaluating these discrepancies in the estimated effects, it is important to keep in mind that recent and old migrants' experiences may differ significantly and convey different information regarding individuals' migration behavior and that these differences might be compounded when taking into account the heterogeneity of old migrants in terms of their time of arrival, information that is not included in the census data. Therefore, explaining differences in the estimated effects between the recent and old migrant ratios calls for future studies equipped with data that contain complete information on individuals' migration experiences.

VI. Conclusion

In this study, I explored variation in the inflow of recent migrants experienced by Turkish provinces to estimate the causal effects of internal migration on urban male natives' labor-market outcomes. In particular, the estimates capture differences in these natives' outcomes between 1990 and 2000 in provinces with a sizable change in the recent migrant ratio relative to provinces without such a change. The results suggest that native males who were residing in provinces with a significant increase in migrant inflows observed deteriorations in their labor-market outcomes. In particular, a higher inflow of recent migrants lowered the native males' employment ratio significantly. Furthermore, when

TABLE 8

ESTIMATED EFFECTS OF THE RECENT AND OLD MIGRANT–NATIVE RATIOS ON LABOR-MARKET OUTCOMES BY MIGRANT STATUS

	Labor Force–Population Ratio				Employment-Population Ratio			
	Cross Section, OLS, 1990	Cross Section, OLS, 2000	First Difference	First Difference, IV	Cross Section, OLS, 1990	Cross Section, OLS, 2000	First Difference	First Difference, IV
A. Natives:								
Recent migrant-native ratio	.297***	.259***	−.141	−.646***	.407***	.442**	−.423*	-2.004***
	(.079)	(.082)	(.101)	(.210)	(.144)	(.176)	(.246)	(.557)
Old migrant-native ratio	−.073***	.037*	−.170***	−.238***	−.017	.055	−.066	-.236
	(.028)	(.019)	(.053)	(.077)	(.050)	(.042)	(.128)	(.203)
Cragg-Donald (1993) statistic				16.97				16.97
B. Permanent natives:								
Recent migrant-native ratio	.374***	.331***	−.06	−.543**	.521***	.574***	−.33	-2.049***
	(.086)	(.091)	(.107)	(.228)	(.160)	(.188)	(.262)	(.633)
Old migrant-native ratio	−.079***	.025	−.168***	−.253***	−.003	.067	.048	-.182
	(.029)	(.021)	(.059)	(.087)	(.055)	(.045)	(.144)	(.240)
Cragg-Donald (1993) statistic				14.49				14.49

C. Old migrants:								
Recent migrant-native ratio	.102	.202***	−.121	−.291	.162	.167	−.129	-1.251***
	(.077)	(.076)	(.126)	(.233)	(.123)	(.123)	(.198)	(.433)
Old migrant-native ratio	−.023	.003	−.083	−.135**	−.011	−.011	−.148*	-.236*
	(.030)	(.008)	(.051)	(.060)	(.049)	(.012)	(.080)	(.111)
Cragg-Donald (1993) statistic				15.63				15.63
D. Recent migrants:								
Recent migrant-native ratio	.204**	.181	−.370**	−.678**	.168	.361*	-.456**	−.666*
	(.082)	(.178)	(.188)	(.337)	(.126)	(.217)	(.196)	(.347)
Old migrant-native ratio	−.021	.234***	−.119	−.152	.078	.202***	.003	−.022
	(.0322)	(.047)	(.090)	(.106)	(.049)	(.057)	(.094)	(.108)
Cragg-Donald (1993) statistic				15.72				15.72

Note. See the note to table 3. For the IV specifications above where there are two endogenous regressors and two instruments, the Cragg-Donald (1993) statistic is reported. As suggested by Stock and Yogo (2003), critical values for this weak-instrument test based on two-stage least squares size are 7.03 for the 10% size, 4.58 for the 15% size, 3.95 for the 20% size, and 3.63 for the 25% size. Standard errors are in parentheses.

* Significantly different from zero at the 10% level.

** Significantly different from zero at the 5% level.

*** Significantly different from zero at the 1% level.

I disaggregated the estimated effect of the overall recent migrant ratio by native males' skills measured by their education and age, the negative consequences of migrant inflows seem to increase with both education and age in the sense that the recent migrant ratio's estimated negative effects are found to be most pronounced for the older population with the highest educational qualifications and to be least pronounced for the younger population with the lowest educational qualifications.

Examining differences in the estimated effects of the recent migrant ratio for different migrant and native male groups enables us to evaluate two competing explanations of how the labor-market effects of internal migration may vary with individuals' native-migrant status. The first one predicts that because recent migrants are likely to be clustered with other recent migrants and old migrants, the displacement effect of the inflow of recent migrants may be greater for both recent and old migrants than for permanent natives, where the greatest adverse effects are expected to felt on recent migrants. In contrast, an alternative explanation reverses this ranking of estimated effects by pointing out the fact that individuals may move to have a better job-location match and to mitigate the effects of negative labor-market shocks caused by higher migrant inflows. The estimation results reveal that migrant inflows are most likely to diminish permanent native males' outcomes, whereas recent migrants are least likely to be adversely affected by these inflows, lending support to the second explanation.

Finally, to answer the question of whether the estimated effects of the recent migrant ratio are biased because of differences in the stock of previous migrants across provinces, I controlled for the old migrant ratio in the second-stage regression model. This also made it possible to evaluate the old migrant ratio's effect on labor-market outcomes. As a result of this empirical exercise, the estimated negative effects of the recent migrant ratio were enhanced. It also revealed that the negative estimated effects of the old migrant ratio are weaker that those of the recent migrant ratio.

Because census data provide limited information on individuals' labor-market success, this study could not capture the effects of internal migration on local labor markets in all its dimensions. In response to a higher inflow of internal migrants, to protect their current employment status, individuals, for example, may accept a wage cut in their current jobs or choose to work in low-paying occupations. Furthermore, migrant inflows may lead to an increase in individuals' transition from the formal to the informal labor market. However, using census data, it is impossible to assess the existence of these adjustment mechanisms in the local labor market. Despite the possibility of these adjustment mechanisms for a given local labor market in response to migrant inflows, the negative association found in this study between migrant inflows

and individuals' labor-market outcomes bolsters our confidence for the possibility that internal migration alters labor-market opportunities across local areas experiencing different densities of migrant inflows.

Appendix A

TABLE A1

DESCRIPTIVE STATISTICS OF VARIABLES USED IN THE FIRST-STAGE REGRESSION ANALYSIS OF LIKELIHOOD OF BEING EMPLOYED AND PARTICIPATING IN THE LABOR FORCE: MALE AGE GROUP AGES 16–64

	Native Male		Permanent Native Male		Old Migrant Male		Recent Migrant Male	
Variable	1990	2000	1990	2000	1990	2000	1990	2000
Age	34.629	34.974	33.635	33.825	36.443	36.908	30.738	30.482
	(12.884)	(12.668)	(13.043)	(12.817)	(12.38)	(12.17)	(10.69)	(10.67)
No formal schooling and illiterate	.058	.033	.061	.036	.052	.029	.036	.018
	(.233)	(.178)	(.240)	(.185)	(.222)	(.166)	(.187)	(.133)
No formal schooling and literate	.027	.032	.027	.032	.028	.031	.018	.021
	(.163)	(.175)	(.162)	(.176)	(.164)	(.174)	(.134)	(.142)
Primary school degree	.538	.441	.537	.419	.540	.477	.424	.291
	(.499)	(.496)	(.499)	(.493)	(.498)	(.499)	(.494)	(.454)
Middle school degree	.141	.163	.152	.178	.120	.138	.133	.114
	(.348)	(.369)	(.359)	(.382)	(.325)	(.345)	(.339)	(.318)
High school graduate	.162	.233	.165	.252	.155	.200	.239	.360
	(.368)	(.423)	(.371)	(.434)	(.362)	(.400)	(.427)	(.480)
2-year or 4-year university graduate	.074	.099	.057	.083	.105	.126	.150	.196
	(.262)	(.299)	(.232)	(.276)	(.307)	(.331)	(.357)	(.397)
N	398,763	586,605	257,708	367,987	141,055	218,618	54,061	62,670

Note. The listed variables are used to estimate the provincial-level employment-population and labor force–population ratios in the first-stage estimation. Standard deviations are in parentheses.

TABLE A2

DESCRIPTIVE STATISTICS OF VARIABLES USED IN THE SECOND-STAGE REGRESSION ANALYSIS OF LABOR-MARKET OUTCOMES

Variables	1990	2000	Change
Recent internal migrant-native ratio	.129	.104	−.025
	(.048)	(.031)	
Log (advanced/no education)	.231	.902	.671
	(.618)	(.604)	
Log (intermediate/no education)	1.357	1.574	.217
	(.491)	(.510)	
Mean age/100	.338	.343	.005
	(.009)	(.012)	
Log (province population)	11.186	11.423	.237
	(1.017)	(1.115)	

Note. Weighted means are presented in the table where the number of natives ages 16–64 in the province is used as a weight to calculate weighted means of variables. Standard deviations are in parentheses.

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