Migration, the Quality of Life, and Economic Opportunities in the U.S. Revisited: Impacts of Round-Trip Work Commute Time and Rent or Single-Family Housing Prices

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ABSTRACT

Given the importance to businesses of having a better understanding of factors that influence migration, this study argues that there are two dimensions of the quality of life and economic opportunities that have largely been ignored in previously published studies of migration patterns in the U.S.: the impacts of (1) the costs of commuting between one's residence and one's place of employment and (2) apartment rent-levels and single-family housing price levels. It is hypothesized here that the greater the commute time between one's prospective place of residence and one's prospective place of employment, the greater the costs associated with in-migration to that potential residence in terms not only of the value of time expended round-trip in commuting but also the opportunity costs and mental health costs (stress) of that time along with the greater pecuniary costs that accompany longer commutes. Therefore, it is hypothesized that in-migration to an area is a decreasing function of commute time associated with that area. A second hypothesis proffered here is that greater housing-cost levels reduce disposable real income and hence utility. More specifically, we argue that either higher apartment rent levels or higher prices on single family homes reduce disposable real income and thereby reduce household well-being; hence, in-migration to an area is hypothesized to be a decreasing function of those higher rent levels and higher home prices. Based upon panel 2SLS estimates, where net in-migration and gross in-migration over the 2010-2017 period are separately considered, there is strong initial empirical support for both hypotheses.

KEYWORDS

Net In-Migration, Gross In-Migration, Round-Trip Travel Time to Work, Rent, Single-Family Housing Prices, Panel Data, Control Variables

INTRODUCTION

Obviously, business success is predicated upon a large and diverse assortment of factors. Among these is a sound understanding of which markets are more likely to grow and hence yield potentially greater growth in demand for the goods and services that businesses provide to the marketplace over time. Given that migration patterns contribute significantly to the pattern of population growth across the U.S., the greater the insights firms can garner regarding the determinants of migration patterns, the better poised they will be to benefit from that knowledge. Accordingly, this study attempts to provide new insights into factors that influence migration, both net and gross; this is accomplished through the testing of two new hypotheses involving heretofore largely overlooked phenomena as well as the consideration of a variety of well-established migration-influencing factors.

A number of studies in the empirical literature on domestic migration in the U.S. have investigated or at least theoretically considered, either as the central focus/theme of study or simply as one or more

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control variables (e.g., climate), the impact of various of the many and diverse dimensions of the quality of life on net or gross in-migration patterns (Tuckman, 1970; Gatons and Cebula, 1972; Gallaway, 1973; Sommers and Suits, 1973; Mixon, 1994; Hsing and Mixon, 1996; Chi and Voss, 2005; Mitze and Schmidt, 2015; Clark and Hunter, 1992; Mixon and Hsing, 1992; Eliasson et al., 2015; Foley and Dajci, 2015; Gale and Heath, 2000; Jolley et al., 2012; Shumway, et al., 2014; Onder and Schlunk, 2015; Capener and Saltz, 2016;Young et al., 2016; Cebula et al., 2016). One of the earlier studies that focused more broadly on, i.e., on a variety, of quality-of-life migration determinants, was that by Cebula and Vedder (1973), who investigated, for the case of SMSAs across the U.S., the migration impact of a number of quality-of-life factors. Specifically, they (pp. 205, 208) sought to investigate whether, in addition to economic factors, whether domestic "…contemporary American human migration can be significantly explained by such 'environmental' factors as pollution, crime rates, and climate [and] health (medical) care services availability?"

The purpose of this exploratory study is to answer a somewhat broader version of this question, namely, whether (1) greater commute time between place of residence to place of employment and (2) higher apartment rent levels or higher prices of single-family homes exercise negative impacts on in-migration patterns.

TWO HYPOTHESES

Arguably, an important dimension of the quality of life, broadly defined, involves time. From the perspective of this study, commuting time *per* se, along with the accompanying pecuniary and non-pecuniary costs incurred when traveling between the place of one's residence and the place of one's employment, exercises a potential impact on migration decisions. The influence of commute time on migration patterns in the U.S. has not received a great deal of attention from researchers, although Molloy et al., (2017) is an exception. Furthermore, although there are such studies for other nations, including Green (1999) for the case of Britain, Champion et al., (2009) for the case of rural England, Romani et al., (2003) for the case of Spain, and Sandow and Westin (2010) and Korpi, et al., (2010) for the case of Sweden, the overall number of studies with this emphasis is also modest.

This empirical study of migration integrates roundtrip mean commuting time (*COMTIMEjt*) into the analysis of residential location decisions. The interpretation and resulting hypothesis involving commuting time and the migration decision are straightforward. In particular, the greater the commuting time between one's residence and one's place of employment: (1) the greater the time lost/expended and hence the greater the opportunity costs associated with commuting, since that time that could, e.g., have been spent earning income or interacting with one's family and/or friends or participating in recreation and/or other activities such as exercise or reading or gardening; (2) the greater the commute time between residence and place of employment, the greater the stress that is experienced and hence the lower the well-being of the commuter involved, which is consistent with various studies of the role of the commuting experience in elevating stress, including Etema, et al., (2010), Gatersleben and Uzzall (2007), Koslowsky (1997), and Wener and Evans (2011); and (3) the greater the concomitant pecuniary commuting costs (in the form of private and/or public transportation costs) incurred with that commute [see below for more specifics]. These considerations comprise costs associated with migration to a place that is not immediately adjacent to one's place of work. Accordingly, to the extent that such costs have *not* been capitalized into rents or housing prices, the greater the roundtrip commute time from one's residence at location *j* to one's job, the greater the cost associated with migrating to location *j* and hence the lower the likelihood of one's migrating to that would-be residential locus. This empirical study investigates whether in-migration in recent years has been influenced by this quality-of-life/economic factor referred to as commute time, hypothesizing that in-migration to one's residence at location *j* is in year *t* a decreasing

function of the commute time between that location and the location of one's place of employment (*COMTIMEjt*), *ceteris paribus*. This perspective is arguably consistent with Alonso (1964), who took the position that commuting distance (as opposed to commuting time) between workplace and residence is important because commuting costs are an increasing function of distance; hence, consumers who choose sites closer to the workplace incur lower costs of commuting, *ceteris paribus*.

The second hypothesis proffered here involves a commonly overlooked economics variable in the empirical migration literature, namely, the price of housing, whether reflected, e.g., in the form of rental levels *per se* or the price on single family homes *per se*. Although the migration impact of the overall cost of living has been acknowledged in a number of studies (Cebula, 1978; Renas, 1978, 1983; Gale and Heath, 2000; Korpi, et al., 2010; Onder and Scklunk, 2015, Foley and Dajci, 2015), the impact of *average apartment rental* levels (*RENTjt*) *per se* [or the mean price on single family homes (*HOUSEPRjt*)] remains understudied, if not overlooked, in most of the empirical migration literature (cf. Potepan, 1994, Withers and Clark, 2006). In any event, it is hypothesized in the present study that in-migration to area *j* in year *t* is a decreasing function of the rental level (or housing price level), *ceteris paribus*, because of the negative impact of higher rent or higher housing prices on household real income and hence utility.

To accommodate studying these two hypotheses, the in-migration rate in this study is expressed as the ratio of *net* in-migration to each county *j* in the state of Virginia in year *t* to the population in that county *j* in year *t*. The value of that ratio is then converted to a percentage and represented by the variable *INMIGjt*, which is modelled here such that:

$$INMIGjt = f(COMTIMEjt, RENTjt \text{ or } HOUSEPRjt, \ldots) \quad (1)$$

$$fCOMTIMEjt < 0, fRENTjt < 0, HOUSEPRjt < 0 \quad (2)$$

The empirical analysis in the present study first deals with *net* in-migration rates; however, it then *also* addresses *gross* in-migration (see Section 5 below).[1] According to Schaeffer, et al., (2011), it can be argued that gross in-migration can provide more useful insights than net migration. Indeed, Schaeffer, et al., (2011, p. 107) state that "We use gross migration because the use of net migration involves a sub-standard loss of information and provides no apparent advantages." In particular, (p. 107), "The effects of migration on sending and receiving counties depend on the characteristics of the migrants and in-migrants and out-migrants are unlikely to have nearly identical characteristics." Others, such as Cebula et al., (2016) and Jolley et al., (2012) implicitly concur. On the other hand, numerous studies favor the use of net in-migration presumably at least in part because it may provide a better predictor of *net population growth* (Eliasson et al., 2015; Gallaway, 1973; Cebula and Vedder, 1973; Foley and Dajci, 2015; Renas, 1978; 1983). In the present study, rather than take sides on this issue, we consider both, i.e., we consider not only net in-migration but also gross in-migration. Interestingly, as it turns out, the estimation results from both perspectives yield, qualitatively speaking, very similar conclusions and, of greatest interest from the perspective of this study, also act to support both of the hypotheses presented above.

In any case, this empirical study focuses upon the state of Virginia. Virginia has the advantage that a fairly large portion of the state's population resides within commuting distance of Washington, D.C., along with other larger metropolitan areas such as Richmond and Norfolk, so that incurring commute costs to work is a commonplace circumstance for state residents. Moreover, Virginia also is a state, in sharp contrast to the U.S. *as a whole*, that experiences somewhat homogeneous climatic conditions, which more easily enables us to not treat climatic conditions as significantly influencing net in-

[1] Equations paralleling (1) and (2) but focused on *gross* in-migration rates are considered in Section 5 of this study.

migration among the various Virginia counties. The choice of this state is also predicated upon the accessibility of certain needed data.

CONTROL VARIABLES: QUALITY OF LIFE AND ECONOMIC VARIABLES

Having stated the two primary hypotheses being investigated in this study, the analysis next identifies the control variables adopted. These fit into two categories: (1) quality of life factors and (2) economic factors.[2]

To start, this study adopts two quality of life control variables that have heretofore been considered in various migration studies: the crime rate (violent crime plus property crime, as in Renas (1983) and Foley and Dajci (2015), in area *j* in period *t* per 100,000 population (*CRIMEjt*); and (2) population density per square mile in area *j* in year *t* (*POPDENSjt*), i.e., the number of people per square mile (Sandow and Westin, 2010; Foley and Dajci, 2015). It has been argued and found that the higher the crime rate, the lower the net benefits associated with residence in an area. Hence, it is expected that *INMIGjt* is a decreasing function of *CRIMEjt*. Furthermore, to the extent that greater population density acts to increase congestion and crowding in an area, it is also expected that *INMIGjt* is a decreasing function of *POPDENSjt*.

This study also adopts two standard economic control variables found in empirical migration studies, namely, median household income (*MEDHHINCjt*) and the increase in the unemployment rate (*ΔUNRjt*). Following conventional economic analysis of the impact of these variables on in-migration, it is expected that, *ceteris paribus*, the migration rate is an increasing function of *MEDHHINCjt* and a decreasing function of *ΔUNRjt*.

PERIOD FIXED-EFFECTS, COUNTY FIXED-EFFECTS, AND ENDOGENEITY: NET IN-MIGRATION

The analysis adopts a panel dataset consisting of annual data for the post Great Recession period from 2010 through 2017 for the counties in the state of Virginia. Predicated upon Sections 2 and 3 above, the following general implicit-form model is ultimately to be investigated:

$$INMIGjt = f(COMTIMEjt, RENTjt \text{ or } HOUSEPRjt, CRIMEjt, POPDENSjt, MEDHHINCjt, \Delta UNRjt) \quad (1)$$

where it is expected that:

$$f_{COMTIMEjt} < 0,\ f_{RENTjt} < 0 \text{ or } f_{HOUSEPRjt} < 0,\ f_{CRIMEjt} < 0,\ f_{POPDENSjt} < 0,\ f_{MEDHHINCjt} > 0,\ f_{\Delta UNRjt} < 0 \quad (2)$$

In equation (1) and in (2), the issue of lags and other matters have not been considered as yet. This dimension of the modeling is considered in equations (3) and (4) and the surrounding text provided below. It is observed that whereas *net* in-migration is considered in this section of the study, *gross* in-migration is considered in the subsequent section.

We begin with the observation that, based upon (1) and on (2) above, two effectively parallel specifications can be estimated, depending upon whether we focus on rental levels or on single family housing prices. Accordingly, we estimate the following models:

$$INMIGjt = a_0 + a_1 COMTIMEjt + a_2 RENTjt + a_3 CRIMEjt\text{-}1 + a_4 POPDENSjt\text{-}1 + a_5 MEDHHINCjt + a_6 \Delta UNRjt\text{-}1 + \lambda j + \theta t + \mu jt \quad (3)$$

[2] For alternative perspectives that are argued to be pertinent to circumstance in Britain, Spain, and Sweden, see Green (1999), Romani et al., (2003), and Sandow and Westin (2010), respectively. Arguably, commuting time and costs are a component of the so-called "residential rent bid function" (Nourse, 1968, p. 110).

$$INMIGjt = b_0 + b_1 COMTIMEjt + b_2 HOUSEPRjt + b_3 CRIMEjt\text{-}1 + b_4 POPDENSjt\text{-}1 + b_5 MEDHHINCjt + b_6 \Delta UNRjt\text{-}1 + \Lambda j + \beta t + \mu jt' \quad (4)$$

where Λj reflects county fixed effects and βt reflects period fixed effects and the terms μjt and $\mu jt'$ are the error terms, with subscript *j* representing county *j* and subscript *t* representing year *t* and with *t* running from 2010 through 2017. Based upon the results of the Hausman (1978) specification test, the models above were estimated using both county fixed effects (dummy variables) and period fixed effects (dummy variables).

It is noteworthy that three of the explanatory variables in each equation are lagged one period/year, namely, *POPDENSjt-1*, *CRIMEjt-1*, and *ΔUNRjt-1*; the reasoning for this lagging is that dependable information on *current* values for these variables is typically unavailable at the county level for all counties (U.S. Census Bureau, "Quick Facts", 2020; FRED, 2020d). By contrast, the remaining variables are left unlagged since access to *current* values for these data is relatively easier to obtain; as explained below, instrumental variables are adopted to address the simultaneity/endogeneity problems that might be present because of the contemporaneous specification. The data were obtained from the Federal Reserve Bank of St. Louis, FRED (2020a; 2020b; 2020c; and 2020d), the National Association of Realtors (2017), and the U.S. Census Bureau (2020). For the interested reader, the VIFs for all of the explanatory variables were less than 4.0; hence, there were no significant problems of multi-collinearity.

It is observed that the dependent variable, *INMIGjt*, is contemporaneous with three of the explanatory variables, namely, *MEDHHINCjt*, *COMTIMEjt*, and *HOUSEPRjt* or (*RENTjt*). Accordingly, the possibility of simultaneity bias arises. To address this issue, instrumental variables were found for each of these three variables. Each of the instruments is lagged three years, i.e., more than any of the variables in the estimating equations *and* each instrument is highly correlated with the endogenous explanatory variable with which it is associated. For equation (3), the instruments also include the three period lags of: the percentage of the population age 25 or over with at least a high school diploma for *MEDHHINCjt*; population density squared (for *COMTIMEjt*); and per capita personal income for *RENTjt*. For equation (4), the same instruments are adopted for *MEDHHINCjt* and *COMTIMEjt*, with the instrument for *HOUSEPRjt* being the three-year lag of the average rent on *one-bedroom* apartments.

The adoption of three-period lags rather than two-period lags for all of the instruments in the estimates is based on the finding that the three-period lags consistently yield J-statistics that are statistically significant at beyond the 5% level, whereas the two-period lag specification for the instrumental variables yields J-statistics that are significant at only the 10% level, which is a somewhat less compelling outcome for establishing that the instruments are exogenous. Interestingly, however, the final regression estimates are extremely similar regardless of the adoption of two- versus three-period lag chosen.

Table 1. Panel 2SLS Estimation of Equation (3), Net Migration

Variable	Coefficient	t-Statistic	Prob.
COMTIMEjt	*-0.24159*	*-2.59*	*0.0100*
RENTjt	*-0.00652*	*-2.19*	*0.0289*
CRIMEjt-1	*-0.00232*	*-2.31*	*0.0212*
POPDENSjt-1	*-0.00441*	*-3.15*	*0.0017*
MEDHHINCjt	*0.00015*	*2.02*	*0.0435*
ΔUNRjt-1	*0.10189*	*1.22*	*0.2226*
Constant	*14.23*	*2.45*	*0.0143*

Note: F-statistic = 13.83; Prob(F-statistic) = 0.000000; Prob(J-statistic) = 0.000475. Study period: 2010-2017. Effects Specification: County Fixed Effects (dummy variables); Period Fixed Effects (dummy variables)

Equations (3) and (4) are both estimated by panel 2SLS, adopting county fixed-effects and period fixed effects, and with robust t-values being reported in the estimates. In Table 1, the *J*-statistic is statistically significant at the 1% level, implying that the instruments are exogenous. Furthermore, in Table 2, the J-statistic is significant at the 2.5% level, also implying that the instruments are exogenous. Based on the estimation results reported in Tables 1 and 2, the *net* in-migration rate is found to be a decreasing function of population density (*POPDENSjt-1*) and the crime rate (*CRIMEjt-1*) while being an increasing function of median household income (*MEDHHINCjt*), all as anticipated, while not being significantly affected by the growth in the unemployment rate.

Table 2. Panel 2SLS Estimation of Equation (4), Net Migration

Variable	Coefficient	t-Statistic	Prob.
COMTIMEjt	*-0.3901*	*-3.64*	*0.0003*
HOUSEPRjt	*-0.000013*	*-3.12*	*0.0020*
CRIMEjt-1	*-0.00397*	*-3.20*	*0.0015*
POPDENSjt-1	*-0.00645*	*-3.30*	*0.0010*
MEDHHINCjt	*0.00044*	*4.18*	*0.0000*
ΔUNRjt-1	*-0.07875*	*-0.65*	*0.5137*
Constant	*7.22*	*0.96*	*0.3361*

Note: F-statistic = 14.20; Prob(F-statistic) = 0.00000; Prob(J-statistic) = 0.02062. Study period: 2010-2017. Effects Specification: County Fixed Effects (dummy variables); Period Fixed Effects (dummy variables)

However, of greater relevance in terms of the objectives of this study, are the findings involving the two central hypotheses proffered in the study, i.e., that that the net in-migration rate is a decreasing function of both rent (or the price on single-family homes) on the one hand and round-trip commute time on the other hand. As shown in both Tables 1 and 2, the net in-migration rate is a decreasing function of the amount of round-trip time expended in traveling between residence and their place of employment (*COMTIMEjt*). This outcome is found to be upheld at beyond the 1%

significance level in the estimation summarized in Table 1 and at the 1% significance level in the estimation provided in Table 2 as well.

The interpretation of this finding of a negative impact of commuting time on the migration decision is arguably straightforward. In particular, consistent with the arguments provided in Section 2 above, the greater the round-trip commuting time between one's prospective residence and one's prospective place of employment, the less attractive it is to migrate to the residential location in question. Thus, greater commute time implies a greater amount of time lost/expended and hence greater the opportunity costs associated with commuting, since that time that could have been spent either earning more income and/or interacting with one's family or friends or participating in recreation and/or other activities such as exercise or reading. Additionally, a greater commute time between residence and place of employment implies greater stress that is experienced and hence lowers the well-being of the commuter involved, which is consistent with various prior studies of the impact of the commuting experience on stress, including Etema, et al., (2010), Gatersleben and Uzzell (2007), Koslowsky (1997), and Wener and Evans (2011). Moreover, with a greater commute time, there are concomitant greater pecuniary commuting costs incurred with that commute. These considerations comprise a cost associated with migration to a place that is not immediately adjacent to one's place of work. Accordingly, the greater the commute time from one's residence at location *j* to one's job, the greater the cost associated with migrating to location *j* and hence the lower the likelihood of one's undertaking migration to that would-be residential locus.

Next, we come to our other hypothesis of interest in this study involving net in-migration and rent on the one hand and on the relationship between net migration and the price of single-family homes on the other hand. Clearly either higher rent levels or higher home prices reduce the household disposable income and, at least potentially, utility, *ceteris paribus*. As shown in Table 1, the net in-migration rate is at beyond the 3% statistical significance level a decreasing function of the average rent level, other things held the same. And in Table 2, which provides an alternative outcome, it is found at the 1% significance level that net in-migration is a decreasing function of the mean price of single-family homes. Arguably, these results parallel those found in studies of migration and the *overall cost of living* (Cebula, 1978; Renas, 1978, 1983; Cebula and Alexander, 2006; Jolley et al., 2012; Foley and Dajci, 2015). The findings summarized in Table 1 and 2 would appear to add credibility to the claim (Brehm and Saving, 1964; Cebula, 1978; Foley and Dajci, 2015) that migrants apparently are not subject to 'money illusion." Finally, for the interested reader, descriptive statistics are provided in Table 3.

Table 3. Descriptive Statistics

Variable	Mean	Standard Deviation	Maximum	Minimum
INMIG	*0.435*	*3.775*	*25.74*	*-31.87*
POPDENS	*953.4*	*1679*	*10694*	*17.75*
CRIME	*983*	*2190*	*6476*	*13*
MEDHHINC	*55014*	*20336*	*136191*	*29550*
COMTIME	*54.5*	*12.85*	*82.8*	*29*
RENT	*741*	*259*	*1513*	*423*
ΔUNR	*0.104*	*1.222*	*7.367*	*-3.80*

GROSS IN-MIGRATION

As alternatives to the models expressed in equations (3) and (4) for *net* in-migration, we now consider the following two equations, which parallel equations (1) and (2) but are expressed in terms of the *gross* in-migration rate (*GRINMIGjt*) rather than net in-migration:

$$GRINMIGjt = c_0 + c_1 COMTIMEjt + c_2 RENTjt + c_3 CRIMEjt\text{-}1 + c_4 POPDENSjt\text{-}1 + c_5 MEDHHINCjt + c_6 \Delta UNRjt\text{-}1 + \lambda j + \beta t + \mu jt \quad (5)$$

$$GRINMIGjt = d_0 + a_1 COMTIMEjt + d_2 HOUSEPRjt + d_3 CRIMEjt\text{-}1 + d_4 POPDENSjt\text{-}1 + d_5 MEDHHINCjt + d_6 \Delta UNRjt\text{-}1 + \lambda j + \beta t + \mu jt' \quad (6)$$

Following the procedure that was summarized in Section 4 above, equations (5) and (6) are both estimated by panel 2SLS, with county fixed effects and period fixed effects; furthermore, robust t-values are reported in both estimates. The estimation results for equations (5) and (6) are reported in Tables 4 and 5, respectively. Overall, in these new estimates involving *gross* in-migration rates, the coefficients and statistical significance levels are shown to be entirely compatible with their counterparts for *net* in-migration, as in Tables 1 and 2.

Table 4. Panel 2SLS Estimation for Gross In-Migration Rate

Variable	Coefficient	t-Statistic	Prob.
COMTIMEjt	*-0.00001*	*-3.71*	*0.0002*
RENTjt	*-0.00034*	*-2.94*	*0.0034*
CRIMEjt-1	*-0.00009*	*-2.99*	*0.0029*
POPDENSjt-1	*-0.00175*	*-3.16*	*0.0017*
MEDHHINCjt	*0.00001*	*3.71*	*0.0002*
ΔUNRjt-1	*-0.0009*	*-0.29*	*0.7756*
Constant	*-0.3945*	*-2.36*	*0.0182*

Note: F-statistic = 14.29; Prob(F-statistic) = 0.0000; Prob(J-statistic) = 0.0497. Study period: 2010-2017. Effects Specification: County Fixed Effects (dummy variables); Period Fixed Effects (dummy variables)

Table 5. Alternative Panel 2SLS Estimation for Gross In-Migration Rate

Variable	Coefficient	t-Statistic	Prob.
COMTIMEjt	*-0.00004*	*-3.65*	*0.0002*
HOUSEPRjt	*-0.0000001*	*-3.02*	*0.0022*
CRIMEjt-1	*-0.00003*	*-3.11*	*0.0020*
POPDENSjt-1	*-0.006*	*-3.19*	*0.0015*
MEDHHINCjt	*0.00042*	*4.07*	*0.0000*
ΔUNRjt-1	*-0.0008*	*-0.59*	*0.5627*
Constant	*0.525*	*7.00*	*0.0000*

Note: F-statistic = 14.34; Prob(F-statistic) = 0.0000; Prob(J-statistic) = 0.0210. Study period: 2010-2017. Effects Specification: County Fixed Effects (dummy variables); Period Fixed Effects (dummy variables)

First, we consider the control variables, where we infer that the gross in-migration rate, as was the case for the net in-migration rate, is found to be a decreasing function of both population density (*POPDENSjt-1*) and crime (*CRIMEjt-1*) while being an increasing function of median household income (*MEDHHINCjt*), although not being significantly affected by the unemployment rate variable. Moreover, and most importantly, the results shown in Tables 4 and 5 lend further support to the two principal hypotheses focused upon in this study.[3] In particular, the estimates reveal that the gross in-migration rate is found to be a decreasing function of commute time on the one hand and both higher rent levels or higher housing prices on the other hand.

CONCLUSION

Given the importance to businesses of having a better understanding of factors that influence migration, this study focuses upon two largely overlooked potential influences on domestic net and gross in-migration in the U.S. One is a quality-of-life factor whereas the other is a fundamentally economic factor. In this exploratory empirical study, it is suggested that in terms of U.S. internal migration there is at least one potential dimension of the quality of life that in effect has been largely ignored in prior empirical studies, namely, round-trip travel time between one's residence and one's place of employment. As discussed in some detail above, the greater this commute time, the greater the costs (which can assume a number of forms) imposed on commuters. Accordingly, it is hypothesized here, *ceteris paribus*, migrants prefer to live in closer proximity to their place of employment, i.e., where the commute time is shorter. A second largely neglected factor considered here, one which is economic in nature, is the rental rate on apartments or, alternatively, the market price of single-family homes. It is hypothesized here that the higher the level of rent or single-family homes, the less attractive that location is to migrants. The present study provides panel 2SLS estimates using county fixed effects and period fixed effects to investigate these hypotheses and finds very strong evidence on behalf of both.

The policy implications of the results from this study are unclear, although improved, more cost-effective public transportation might at least help somewhat to ameliorate the migration impacts of longer commutes while improved, publicly available information on housing prices and rent levels might improve market efficiency to some degree in terms of migration decision-making. Of course, it may well turn out that no such policies are warranted/indicated and that the insights that are derived

[3] Upon email request, results of alternative specifications providing parallel results will be provided.

here are just part of a bigger picture within which to better understand economic behavior and geographic mobility.[4] Indeed, the findings revealed in this study may serve simply improve our understanding and forecasting of migration patterns and population shifts within the U.S.

On the other hand, the insight that areas with higher rent levels or higher single-family home prices will be less attractive to migrants may be useful information for many types of businesses in a variety of circumstances. For example, firms considering expansion may have a greater reason to more seriously consider location of facilities in environments with lower housing prices or rent levels since those areas are more likely to experience faster population growth and hence faster growth in the demand for commodities.

Future research could take various forms, including the study of counties in other states or metropolitan areas, as well as other time periods. The present study, e.g., focuses on the Post Great Recession Period. Future research related endeavors could take that time frame or even a longer one to investigate the issues highlighted here. Naturally, the application of different empirical techniques could be undertaken as could the consideration of more and/or different control variables.

[4] From a policy perspective, one potentially can argue that there may be net social benefits from providing public transit that is more comfortable and which manifests a more peaceful and restful environment for passengers. From a somewhat different policy perspective, policies that lower the private cost of transit, e.g., lower the price of gasoline, may help ameliorate the burden of longer distance commutes. Furthermore, public policies that can help reduce the cost of housing, including reducing general inflation, may be relevant. In any event, a formal benefit/cost analysis, including benefit/cost ratios, should be an integral part of any such policy consideration.

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