The Impact of Economic Freedom and Total Freedom on Gross Sate In-Migration: An Exploratory Study of the Great Recession Experience

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Abstract. Typically, the greater the degree of economic freedom, the more successfully and efficiently markets perform and the greater the prosperity created through private enterprise. These outcomes from greater freedom accelerate economic growth, which in turn creates opportunities for yet further success. It can also be argued that greater personal freedom promotes higher levels of utility for consumers in non-economic ways. Accordingly, the present study empirically investigates whether the prospects of greater economic freedom on the one hand and greater economic *plus* personal freedom, i.e., greater *total* freedom, on the other hand in any given state vis-à-vis other states act(s) to induce a greater net influx of migrants. This empirical study of domestic U.S. migration during the Great Recession finds clear evidence that migrants prefer to move to those states affording higher levels of economic freedom and higher levels of total freedom.

Keywords: gross state in-migration; economic freedom; total freedom
J.E.L. codes: H24; J61, J68, P14, R23

Introduction

Migration determinants within the U.S. have been extensively researched, especially for the post Vietnam War era (West, Hamilton & Loomis, 1976; Vedder, et al., 1986; Percy, Hawkins, & Maier, 1995; Carrington, Detragiache, & Vishwanath, 1996; Nechyba, 2000; Conway & Houtenville, 1998, 2001; Chi & Voss, 2005; Cebula & Alexander, 2006; Partridge & Rickman, 2006; Francis, 2007; Landry, et al., 2007; Cebula & Clark, 2013; Plantinga, et al., 2013). The factors considered within the context of *internal/domestic* migration determinants are extremely diverse. By and large, the contemporary mainstream migration literature finds migrants being attracted to areas with lower living costs, better income prospects, lower taxes, and a warmer climate.

It is in the spirit of this diversity that the present study seeks to investigate whether contemporary domestic migration in the U.S. is influenced by the degree of economic freedom and by the degree of total freedom (economic freedom plus personal

freedom). More specifically, using the indices of overall economic freedom and overall personal freedom developed by Ruger & Sorens (2009) within an otherwise conventional migration model, this study empirically investigates whether state-level domestic gross in-migration is positively impacted by higher levels of economic freedom higher levels and/or by higher levels of total freedom (economic freedom plus personal freedom). These latter two factors have effectively been ignored in the mainstream migration literature for their potential migration impact.

Economic growth at the *regional* level can derive from a variety of sources, including in-migration. Indeed, the latter plays an extremely important role in the pattern of economic growth across the U.S. In this study, the potential roles of economic freedom (treated as an economic trait of each state) on the one hand and total freedom, economic plus personal freedom (treated as both an economic trait of each state and a quality of life trait of each state), on the other hand on gross state in-migration are investigated for the period 2008-2009. In addition, the impact of a variety of economic (including public policy) and quality of life factors are included in this study; as stated above, such factors have been found in certain previous research to significantly influence migration and thus cannot be ignored. Finally, to test the resiliency of the model, estimates are also provided that modify and expand the basic model.

Interestingly, the index of economic freedom recently developed by Ruger & Sorens (2009) includes measures of state sales and cigarette excise tax revenues, state, county, and municipal debt burdens, and certain municipal and county tax collections and expenditures in each of the 50 states; therefore, these factors are not expressly included in this study as *separate* variables because to do so would effectively be to introduce

redundancy. However, following arguments in Tiebout (1956) and Tullock (1971), the effective state income tax rate and per capita state plus local property taxes, which are *not* included in the Ruger and Sorens (2009) data, is expressly included in the present empirical analysis among the explanatory economic variables. The adoption of *state-level data* to investigate the impact of state income taxation or other such government policies on migration flows can be found in a number of previous studies (Sommers & Suits, 1973; Saltz, 1998; Conway & Houtenville, 1998, 2001; Gale & Heath, 2000; Partridge & Rickman, 2006; Cebula & Alexander, 2006; Cebula & Clark, 2013).

Economic Freedom and Personal Freedom

Ruger & Sorens (2009, p. 1) predicate their study ultimately on the definition of *individual freedom* as being "…the ability to dispose of one's own life, liberty, and justly acquired property however one sees fit, so long as one does not coercively infringe on another's ability to do the same." Ruger & Sorens (2009) proceed to develop a number of freedom indices, including an elaborate index of *overall* economic freedom and a separate elaborate index of *overall* personal freedom. This study investigates the impact of economic freedom per se and total freedom, which is the sum of economic freedom and personal freedom combined, on gross- state in-migration in the U.S.

In part, as observed above, the overall index of economic freedom consists of a fiscal policy dimension involving state sales and cigarette tax revenues, state, county, and municipal debt burdens in each state, and certain municipal and county tax collections and expenditures in each of the 50 states. However, this index of overall economic freedom also consists of a regulatory policy dimension, which considers labor regulation, health insurance mandates, occupational licensing, the tort system, eminent domain, and

land and environmental regulation (Ruger & Sorens, 2009, p. 8). The index of overall personal freedom reflects the "Paternalism" concept (Ruger & Sorens, 2009, p. 9). Interestingly, regulations that have a primarily "paternalistic" justification, such as home- and private school regulations, are placed under this measure of freedom, along with citizen rights to educate their own children and to be free of unreasonable search and seizure. These indices are argued to be part of the continuing process of improvements in the measurement of economic freedom and personal freedom (Ruger & Sorens, 2009, p. 6).

Ruger & Sorens (2009, p. 1, Table, III, Table IV, Table V) argue that they improve on previous efforts at measuring freedom across states in three ways. First, they include (as observed above) measures of personal and social freedoms such as the rights of peaceful citizens to educate their own children and to be free of unreasonable search and seizure. In addition, they include measures of the rights of peaceful citizens to be free of bans on smoking, to own and carry firearms, and to make free choices involving same-sex partnerships and marijuana consumption. Second, they include more variables as well as more complete data sets in their index construction process than previous studies. Third, they observe that they adopt new and more accurate measures of key variables, including fiscal policies (tax, expenditure, and debt) by county and municipal governments in each state. For these reasons, Ruger & Sorens (2009, p. 6) claim their report "…not only provides a broader framework for understanding the state of freedom in the American states, but also more carefully measures the economic components of freedom."

Since the Ruger & Sorens (2009) study is alleged to provide more dependable, more accurate, and more robust economic freedom indices and personal freedom indices than heretofore available, the Ruger & Sorens (2009) *overall* economic freedom *and* personal freedom indices are adopted as the freedom measures (economic freedom and total freedom) in the present study of determinants of U.S. internal migration. Naturally, consistent with the mainstream economics literature on migration determinants, a number of additional economic variables (broadly defined) and non-economic variables are included in the study.

The Framework for Gross In-Migration

The consumer-voter is treated as regarding migration as an investment decision. Accordingly, the decision to migrate from one location to another location requires that the consumer's expected net benefits of moving from the present location to the other location be positive. In addition, the actual migration destination must reflect the maximum value that could be expected from moving from the present location to *any other* known and plausible alternative destination. Alternatively stated, the migration decision is treated as an investment such that one's decision to migrate from area *i* to area *j* requires the net discounted present value of migration from area *i* to area *j*, *DPVij*, be (a) positive and (b) the maximum net discounted present value that can be expected from moving from area *i* to *any other* known, plausible alternative destination. Thus, migration will flow from area *i* to area *j* only if:

$$DPVij > 0; DPVij = \text{MAX for } j, \text{ where } j = 1,2,\ldots,z \quad (1)$$

where *z* represents all of the known plausible alternative destinations for the consumer-voter.

Following in principle the standard migration investment model (Riew, 1973), the migration decision initially focuses principally on two sets of broad considerations, namely:

1. Economic conditions, including economic freedom [a factor effectively overlooked in previous related studies] and certain *state* and local fiscal variables; and
2. Environmental and quality-of-life factors, including, in half of the estimates personal freedom inasmuch as it is one of the components of total freedom as defined here [another factor overlooked in previous related studies].

In the empirical estimates, initially to measure gross in-migration (*GRMIGRATj*), the gross number of in-migrants to state *j* over the 2008-2009 time period is first divided by the year 2008 population in state *j* and then the resulting decimal, which lies between -1.0 and +1.0, is converted to a percent, which obviously can be either a positive or negative number. The alternative estimates express the migration rate thusly computed in natural log form, with the models being estimated in semi-log form.

Five fundamentally economic factors are initially considered in this analysis. The first of these is *PCPERSINCj*, the per capita personal income in state *j* in the year 2008. This variable is initially adopted as a measure of income prospects in state *j*. Other things held the same (*ceteris paribus*), higher income states should be more attractive to migrants because with a higher income people have higher living standards. The second variable, *COSTOFLIVj*, measures the overall cost of living in state *j* for the average four-person family in the year 2008. This variable is expressed as an index, with the mean of this variable being approximately 100.00. The expected impact of a higher cost of living

on migration is negative. This is because, *ceteris paribus*, a higher overall cost of living would reduce a family unit's purchasing power and hence its living standard. The variable *STINCTAXRj* is the effective state income tax *rate* in state *j* in the year 2008. The higher the state income burden in a state, the lower the level of disposable family income, *ceteris paribus*, and hence the less appealing the state is as a migration destination (Saltz, 1998; Conway & Houtenville, 2001; Cebula & Alexander, 2006). Adoption of this variable has at least two rationales: (1) this variable is entirely omitted from the Ruger & Sorens (2009) economic freedom measure and (2) inclusion of this variable (as argued in Cebula & Alexander, 2006) is in principle consistent with arguments in both Tiebout (1956) and Tullock (1971). Similarly, the variable *STLOPROTXPCj* is the per capita state plus local property tax in state *j* in 2007. Naturally, it is expected that in-migration should be a decreasing function of this variable, *ceteris paribus*, since the higher its value the lower the disposable income level.

The fifth economic variable in the analysis, but the economic variable of greatest interest in this study, is the measure of economic freedom, *ECONFREEj*. This variable is expressed in the form of an index, and it endeavors to quantify the degree of economic freedom in state *j*. The values of this variable vary widely across states and can lie in the range of (-1), which would correspond to the lowest possible degree of economic freedom, to (+1), which would correspond to the highest possible degree of economic freedom. The formal role of *ECONFREEj per se* in a migration analysis appears to be essentially unstudied (Ruger & Sorens, 2009, p. 2). According to the latter study, gross in-migration should be an increasing function of economic freedom, *ceteris paribus*, as a reflection of the desirability of greater economic freedom.

To measure environmental and quality-of-life conditions in state *j*, we initially consider three factors. The first is *AVEJANTEMPj*, the average daily temperature in January in state *j* (1971-2000), as a measure of climatic conditions. It is commonplace in migration studies of the U.S. to hypothesize and to find empirically that migrants on average prefer residence in warmer climates (Clark & Hunter, 1992; Saltz, 1998; Conway & Houtenville, 1998, 2001; Gale & Heath, 2000; Cebula & Alexander, 2006). Thus, gross domestic in-migration is expected to be positively related to *AVEJANTEMPj*, *ceteris paribus*. To reflect environmental quality, the variable *TOXICHEMRj* is adopted. Variable *TOXICHEMRj* is defined as the number of pounds per capita of toxic chemical releases in state *j* in the year 2000. Presumably, for health reasons, migrants would prefer residence in states with lower levels of toxic chemical releases, *ceteris paribus* (Saltz, 1998; Conway & Houtenville, 1998, 2001; Gale & Heath, 2000; Cebula & Alexander, 2006). As a reflection of another dimension of the quality of life in state *j*, namely, recreation, we introduce the per capita level of state parks accessible to the public in each state, *STPKSPCj*. Arguably, gross in-migration is expected to be an increasing function of this variable since the more accessible/plentiful the parks are, the greater the recreational value of residing in the state, *ceteris paribus*.

The definitions and data sources for each of the nine variables described above are provided in Table 1. In addition, the means and standard deviations for each of the variables are provided in Table 2. It may be worth noting that the mean values for the economic freedom (*ECONFREEj*) and personal freedom (*PERSFREEj*) indices are +0.00398 and +0.00204, respectively. At first glance, these latter two averages may seem very low; however, in theory, these freedom indices *could* lie between -1.0 (for low) and

+1.0 (for high).[1] Thusly viewed, the average value for *ECONFREEj* and *PERSFREEj* may *not* seem extraordinarily low. The study includes all 50 states.

Table 3 provides the correlation matrix among the explanatory variables, where it is revealed that there are no multicollinearity problems. However, the introduction of the personal freedom variable (*PERSFREEj*), as a *separate* variable, *does* introduce multicollinearity problems into the study framework; Therefore, rather than expressly introducing *PERSFREEj* as a distinct separate variable in any of the models in this study, we introduce personal freedom into the analysis by combining it with economic freedom to create the *total* freedom variable (*TOTALFREEj*) considered later on in the study.

Initial Empirical Results

The fundamental focus in this study is on the impact of economic freedom and economic plus personal freedom, i.e., total freedom, on gross in-migration. As explained in the preceding section of this study, the migration decision is a complex one. Thus, although the roles of economic freedom and total freedom in the migration decision can be studied, it is nevertheless necessary to allow for the additional factors that influence migration. Indeed, based upon the framework developed above, migration (*GRMIGRAT*) is potentially influenced not only by economic freedom (*ECONFREE*) and total freedom, but also by the levels of *PCPERSINC*, the *COSTOFLIV*, the *STINCTAXR*, the *STLOPROTXPC,* the *AVEJANTEMP*, *TOXICHEMR*, and *STPKSPC*.

The model initially focuses upon economic freedom and is first estimated in linear form, as expressed in equation (2) below:

[1] The reader may be interested in the fact that the *actual* high and low for the *ECONFREEj* variable are 0.405 and -0.589, respectively, whereas the actual high and low for the *PERSFREEj* variable are + 0.272 and -0.294, respectively.

$$GRMIGRRATj = a_0 + a_1\ PCPERSINCj + a_2\ COSTOFLIVj + a_3\ STLOPROTXPCj$$
$$+ a_4\ STINCTAXRj + a_5\ ECONFREEj\ +\ a_6\ AVEJANTEMPj$$
$$+ a_7\ TOXICHEMRj\ + a_8\ STPKSPCj\ +\ u \qquad (2)$$

where a_0 = constant term and u = the stochastic error term. Based upon the preceding discussion, the following coefficient signs are hypothesized:

$$a_1 > 0,\ a_2 < 0,\ a_3 < 0,\ a_4 < 0,\ a_5 > 0,\ a_6 > 0,\ a_7 < 0,\ a_8 > 0 \qquad (3)$$

To test the consistency and resiliency of the model, the semi-log form of the above equation that is also estimated by OLS is

$$\log(GRMIGRRATj) = b_0 + b_1\ PCPERSINCj + b_2\ COSTOFLIVj$$
$$+ b_3\ STLOPROTXPCj + b_4\ STINCTAXRj + b_5\ ECONFREEj$$
$$+ b_6\ AVEJANTEMPj + b_7\ TOXICHEMRj\ + b_8\ STPKSPCj\ +\ u' \qquad (4)$$

where log(*GRMIGRRATj*) is the natural log of net migration, *GRMIGRRATj*, and is computed as already described earlier in this study.

The initial results of the formal empirical analysis are provided in Table 4. It is noteworthy that in all of the estimations in this study, the White (1980) heteroskedsaticity correction is adopted. In any case, in columns (a) and (b) of Table 4, the results of estimating equations (2) and (4), respectively, are provided. In column (a) of Table 4, all eight of the estimated coefficients exhibit the expected signs; furthermore, all of these coefficients are statistically significant at the 5% level or beyond. With a coefficient of determination (R^2) equal to 0.74, the statistical analysis explains roughly three-fourths of the variation gross state in-migration rate that occurred over the 2008-2009 study period. Finally, the *F*-statistic is statistically significant at the 1% level, attesting to the overall strength of the model.

Most pertinent to the focus in this study, when examining the estimation results on migration and its determinants, is the strong empirical support for the following hypotheses regarding the potential impacts of economic freedom. As revealed in column (a), at the 2.5% statistical significance level, gross in-migration is positively related to economic freedom; that is, the higher the degree of economic freedom in a state, other things held the same, the greater the gross in-migration rate.

In addition, from the remaining results shown in column (a) of Table 4, one can also infer the following impacts of the remaining variables on migration:

1. At the 3% statistical significance level, the higher the personal income tax rate in a state, other things held the same, the lower the gross in-migration rate;
2. At the 1% statistical significance level, the higher the cost of living in a state in a state, other things held the same, the smaller the gross in-migration rate;
3. At the 1% statistical significance level, the higher the per capita property tax burden in a state, other things held the same, the smaller the gross in-migration rate;
4. At the 1% statistical significance level, the higher the average daily January temperature in a state, other things held the same, the greater the gross in-migration rate;
5. At the 1% statistical significance level, the higher the number of state parks per capita, the greater the gross in-migration rate;
6. At the 3% statistical significance level, the higher the per capita level of toxic chemical releases, the lower the gross in-migration rate; and

7. At the 5% statistical significance level, the higher the per capita personal income level, the greater the gross in-migration rate.

Next, we consider the results of estimating the model [equation (4)] with the migration variable expressed in natural log form, a common statistical framework for studying migration determinants; indeed, expressing migration flows in logarithmic form has been practiced for a number of years (Cebula, 1974; Falaris, 1979; Justman, Levy, & Gabriel, 1988; Carlos, 2002). In any event, these semi-log estimation results are provided in column (b) of Table 4. Not surprisingly, estimates (a) and (b) are *qualitatively* very similar to one another. This is because both statistical estimates are dealing with the same explanatory variables and only the dependent variable (migration) is expressed differently. In any case, in column (b) of Table 4, once again, all eight estimated coefficients exhibit the expected signs, with six of these being statistically significant at the 1% level and two being statistically significant at the 5% level. The R^2 of 0.77 indicates that the model explains more than three-fourths of the gross in-migration rate variation. The F-statistic is once again statistically significant at the 1% level.

Of course, the most relevant of the results shown in column (b), in terms of the focus in this study, is the additional strong statistical support for the following hypotheses regarding the impacts of economic and personal freedom on domestic migration. At the 2% statistical significance level, gross state in-migration is positively related to economic freedom; that is, the higher the degree of economic freedom in a state, other things held the same, the greater the gross in-migration rate (as measured, i.e., in natural log form.

The remaining results in column (b) imply that gross in-migration was an increasing function of *PCPERSINC, AVEJANTEMP*, and *STPKSPC*, while being a decreasing function of *COSTOFLIV, STLOPROTXPC, TOXICHEMR*, and *STINCTAXR*.

Total Economic Freedom

To further test the consistency and resiliency of the basic model, equations (2) and (4) are re-estimated with the variable *ECONFREEDOMj* replaced by *TOTALEFREEDOMj* , i.e., the *sum* of *ECONFREEDOMj and PERSFREEj*. These estimations involve the following reduced-form equations:

$$GRMIGRRATj = a_0 + a_1\, PCPERSINCj + a_2\, COSTOFLIVj + a_3\, STLOPROTXPCj + a_4\, STINCTAXRj + a_5\, TOTALFREEj + a_6\, AVEJANTEMPj + a_7\, TOXICHEMRj + a_8\, STPKSPCj + u'' \quad (5)$$

$$\log(GRMIGRRATj) = b_0 + b_1\, PCPERSINCj + b_2\, COSTOFLIVj + b_3\, STLOPROTXPCj + b_4\, STINCTAXRj + b_5\, TOTALFREEj + b_6\, AVEJANTEMPj + b_7\, TOXICHEMRj + b_8\, STPKSPCj + u''' \quad (6)$$

The results from estimating these two equations are provided in columns (a) and (b) of Table 5 for the 2008-2009 gross state in-migration rate and the natural log thereof, respectively. As would presumably be expected, these results parallel those in Table 4. In both of the columns in Table 5, all eight of the estimated coefficients exhibit the expected signs and are statistically significant at beyond the 5% level. In point of fact, in column (a) of Table 5, four coefficients are statistically significant at the 1% level, with four coefficients being statistically significant at the 5% level, whereas in column (b), five coefficients are statistically significant at the 1% level, with three coefficients statistically significant at the 5% level. As for the total economic freedom variable, its coefficient is

now statistically significant at the 2.5% level in column (a) and at the 1% level in column (b).

Thus, based on these results, the gross state in-migration rate to state *j* is an increasing function of not only total freedom (economic freedom plus personal freedom) in the state but also an increasing function of per capita personal income, the average January temperature, and the number of state parks per capita in the state. In addition, the migration rate to state *j* is a decreasing function of the cost of living in the state, the per capita property taxes, the effective state income tax rate in the state, and toxic chemical releases in the state. In any case, there is further affirmation, as hypothesized in this study and also supported statistically in columns (a) and (b) of Table 4, that the higher the values of the freedom index (in this case the total freedom index consisting of economic freedom and personal freedom combined) that exist in a state, the more attractive that state is to would-be migrants, *ceteris paribus*.

Testing for Robustness

The results provided in this study for the economic freedom and total freedom variables are in fact robust across a wide variety of specifications. To illustrate this robustness, we provide empirical results for a multi-faceted variation on the basic model which (a) adds three additional quality of life variables for each state, one allowing for coastal location (*COASTj*), one allowing for cooling degree days (*CDDj*), and one allowing for the presence of hazardous waste sites in each state (*HAZARDj*) while (b) altering the form of the income variable in each state to so reflect unemployment rates and thereby create an arguably better measure of *expected* income potential in each state (*EXPPCPERSINCj*).

In particular, the following reduced-from equations are now to be estimated, with results provided in Table 6:

$$GRMIGRRATj = a_0 + a_1\ EXPPCPERSINCj + a_2\ COSTOFLIVj + a_3\ STLOPROTXPCj + a_4\ STINCTAXRj + a_5\ ECONFREEj + a_6\ AVEJANTEMPj + a_7\ TOXICHEMRj + a_8\ STPKSPCj + a_9\ COASTj + a_{10}\ CDDj + a_{11}\ HAZARDj + u'''' \quad (7)$$

$$\log(GRMIGRRATj) = b_0 + b_1\ EXPPCPERSINCj + b_2\ COSTOFLIVj + b_3 STLOPROTXPCj + b_4\ STINCTAXRj + b_5\ ECONFREEj + b_6\ AVEJANTEMPj + b_7\ TOXICHEMRj + b_8\ STPKSPCj + b_9\ COASTj + b_{10}\ CDDj + b_{11}\ HAZARDj + u''''' \quad (8)$$

$$GRMIGRRATj = a_0 + a_1\ EXPPCPERSINCj + a_2\ COSTOFLIVj + a_3\ STLOPROTXPCj + a_4\ STINCTAXRj + a_5\ TOTALFREEj + a_6\ AVEJANTEMPj + a_7\ TOXICHEMRj + a_8\ STPKSPCj + a_9\ COASTj + a_{10}\ CDDj + a_{11}\ HAZARDj + u''''' \quad (9)$$

$$\log(GRMIGRRATj) = b_0 + b_1\ EXPPCPERSINCj + b_2\ COSTOFLIVj + b_3 STLOPROTXPCj + b_4\ STINCTAXRj + b_5\ TOTALFREEj + b_6\ AVEJANTEMPj + b_7\ TOXICHEMRj + b_8\ STPKSPCj + b_9\ COASTj + b_{10}\ CDDj + b_{11}\ HAZARDj + u'''''' \quad (10)$$

The specifications in these four equations differ from those considered earlier in this study in four ways. First, there is the substitution of variable *EXPPCPERSINCj* for variable *PCPERSINCj*. Variable *EXPPCPERSINCj* is interpreted here as representing *expected* per capita personal income and differs from *PCPERSINCj* because it considers the unemployment rate in state *j*. In particular, the variable *EXPPCPERSINCj*, the expected per capita personal income in state *j* in the year 2008, is computed as unity minus the year 2008 unemployment rate in state *j*, *UNRj* (U.S. Census Bureau, 2010, Table 580), expressed as a *decimal*, multiplied times the year 2008 per capita personal income level in state *j*, *PCPERSINCj*:

$$EXPPCPERSINC_j = (1\text{-}UNR_j) \times PCPERSINC_j \quad (11)$$

This variable is adopted as a potentially more realistic measure of *expected* income prospects in state *j* than *PCPERSINCj* (Saltz, 1998) inasmuch as it involves not only a measure of income in state *j* but also a measure of the likelihood of obtaining that income level should one move to the state in question. Other things held the same, states with higher expected income levels should be more attractive to migrants because with a higher income people have higher living standards.

The remaining three variables are all adopted as additional dimension of (measures of) the quality of life in state *j*. *COASTj* is a dummy variable with a value of 1 if some border or borders of state *j* directly lie on either the Atlantic Ocean, the Pacific Ocean, and/or the Gulf of Mexico. Since such location is presumably deemed desirable because of recreational access and other considerations (Cebula & Alexander, 2006), the expected sign on the coefficient for *COASTj* is positive, *ceteris paribus*. Cooling degrees per annum, *CDDj* (U.S. Census Bureau, 2010, Table 376), reflect the degree to which the heat and humidity in state *j* both are climatically uncomfortable and require greater amounts of air conditioning. Presumably, the coefficient on this variable would be negative (Saltz, 1998; Cebula & Alexander, 2006), *ceteris paribus*. Finally, the third new expressly quality-of-life variable reflects the relative presence of hazardous waste sites in a state in 2008. In particular, the variable *HAZARDPCTj* (U.S. Census Bureau, 2010, Table 371) indicates the percentage of all hazardous waste sites in the U.S. that is located in state *j*. Given the multi-faceted undesirability of such waste sites, it is expected that gross in-migration is a decreasing function of *HAZARDPCTj*, *ceteris patribus*.

The estimates of equations (7) through (10) are provided, respectively, in columns (a) through (d) of Table 6. As shown in this Table, 40 of the 44 estimated coefficients exhibit the expected signs are are statistically significant at the 5% level or beyond. Only the coefficients on *COASTj* are all statistically insignificant. Overall, these results provide consistent empirical support for the results in Tables 4 and 5 and serve as a test of robustness in so doing. Among other things, the findings in Table 6 reveal that the gross state in-migration rate over the study period was an increasing function of expected per capita personal income, warmer January temperatures, greater availability of state parks, while being a decreasing function of the cost of living, the per capita property tax, the effective state personal income tax rate, and the presence of higher levels of toxic chemical emissions, as well as cooling degree days and the presence of hazardous waste sites. The last two of these results are new to this study, whereas the very first of these results is an enhancement of the finding in this study for the income variable (*PCPERSINCj*) in Tables 4 and 5.

Finally, in Table 6, the estimated coefficients on the economic freedom and total freedom variables are all positive, as hypothesized, with thee being statistically significant at the 1% level and the other being statistically significant at beyond the 2% level. Moreover, the coefficient sizes in Table 6 are comparable to their counterparts in Tables 4 and 5. Thus, both economic freedom and total freedom acted to attract in-migration over the study period and there is reason to believe that the results are robust.

Conclusion

This study has statistically investigated the impacts of economic freedom and total freedom on gross domestic in-migration at the state level in the U.S. for the 2008-2009

period. The overall results of the formal empirical analysis are provided in Tables 4, 5, and 6. From the viewpoint of the objective of this study, the most germane of these statistical findings are that gross domestic in-migration is positively impacted by both higher levels of economic freedom and higher levels of total freedom (the sum of economic freedom and personal freedom in each state), as suggested in Ruger & Sorens (2009). Thus, there is evidence strongly suggesting that states offering higher levels of economic freedom and total freedom can be expected to experience higher gross in-migration rates and hence higher population and economic growth rates, *ceteris paribus*. The challenges faced by many states appear obvious. Indeed, this study offers words of advice to state legislatures and governors as well as elected and other officials in state and local government: "to the victor go the spoils"--because households "vote with their feet" in seeking economic and total freedom. Enacting policies that infringe upon these freedoms will be costly over time and not serve the best interest of the citizens of the state.

Table 1: Definitions of Variables and Data Sources (in parentheses)

GRMIGRRATj = the gross number of in-migrants into state j over the July, 2008-July, 2009 time period as a percent of state *j*'s 2008 population (U.S. Census Bureau, 2012, Tables 12 and 15)

PCPERSINCj = the median family income in state *j* in the year 2008 (U.S. Census Bureau, 2010, Table 572)

COSTOFLIVj = average cost of living for a four-person family in state j in the year 2008 (ACCRA, 2009)

STINCTAXRj = the effective average *state* personal income rate in state j in the year 2008 (U.S. Census Bureau, 2010, Table 455)

STLOPROTXPCj = the per capita level of state plus local property taxes in state j, 2007 (U.S. Census Bureau, 2010, Tables 455, 17)

ECONFREEj = an index measuring the level of economic freedom in state j, with the index lying in the range of -1.0 to +1.0 (Ruger & Sorens, 2009, p. 47)

AVEJANTEMPj = the average daily temperature in January in state *j* (over the 1971-2000 reference period), as a measure of warm climatic conditions in the state (U.S. Census Bureau, 2005, Table 378)

TOXICHEMRj = a measure of pollution, expressed in the form of the number of pounds per capita in state j of toxic chemical releases in the year 2007 (U.S. Census Bureau, 2010, Tables 376, 12)

PERSFREEj = an index measuring the level of personal freedom in state j, with the index lying in the range of -1.0 to +1.0 (Ruger & Sorens, 2009, p. 47)

$TOTALFREEDOMj = ECONFREEj + PERSFREEj$

Table 2. Descriptive Statistics

Variable	Mean (Arithmetic Average)	Standard Deviation
GRMIGRRATj	2.91	1.038
PCPERSINCj	38,589	5,939
COSTOFLIVj	100.00	17.31
STLOPROTXPCj	459	571
STINCTAXRj	2.897	1.962
ECONFREEj	0.00398	0.2238
AVEJANTEMPj	32.71	12.65
TOXICHEMRj	7.42	9.79
TOTALFREEDOMj	0.006	0.26

Table 3. Correlation Matrix

	PCPERSINC	*COSTOFLIV*	*STLOPROTXPC*	*STINCTAXR*	*ECONFREE*	*AVEJANTEMP*	*TOXICHEMR*	*STPKSPC*
PCPERSINC	1.000							
COSTOFLIV	0.278	1.000						
STLOPROTXPC	0.378	-0.242	1.000					
STINCTAXR	0.322	0.038	0.261	1.000				
ECONFREE	-0.313	-0.052	-0.300	-0.341	1.000			
AVEJANTEMP	-0.198	0.088	0.150	-0.235	-0.069	1.000		
TOXICHEMR	-0.376	-0.185	0.286	-0.150	0.336	0.219	1.000	
STPKSPC	0.131	0.288	-0.106	-0.226	-0.256	-0.101	-0.154	1.000

Table 4. Initial Empirical Results: Economic Freedom

Dependent Variable	*GRMIGRRATj*	*Log GRMIGRRATj*
Variable\Coefficient	(a)	(b)
Constant	2.588	0.993
PCPERSINC	0.00005* (2.04)	0.00002* (2.49)
COSTOFLIV	-0.015** (-2.94)	-0.0067** (-4.09)
STLOPROTXPC	-0.00009** (-3.34)	-0.00004 (-4.38)
STINCTAXR	-0.126* (-2.23)	-0.037** (-2.60)
ECONFREE	1.03* (2.32)	0.382** (2.64)
AVEJANTEMP	0.02* (2.42)	0.0089** (3.04)
TOXICHEMR	-0.009* (-2.28)	-0.003* (-2.20)
STPKSPC	0.547** (3.37)	0.149** (3.16)
R^2	0.74	0.77
$adjR^2$	0.69	0.72
F	14.62**	16.99**

Terms in parentheses are t-values. **indicates statistically significant at the 1% level; *indicates statistically significant at the 5% level.

Table 5. Additional Empirical Results: Total Freedom

Dependent Variable	*NETMIGRRATj*	*Log NETMIGRRATj*
Variable\Coefficient	(a)	(b)
Constant	2.29	0.886
PCPERSINC	0.00006* (2.40)	0.00002** (2.98)
COSTOFLIV	-0.016** (-3.17)	-0.007** (-4.41)
STLOPROTXPC	-0001** (-3.48)	-0.00004** (-4.45)
STINCTAXR	-0.113* (-2.13)	-0.0332* (-2.38)
TOTALFREE	0.99* (2.49)	0.357** (2.65)
AVEJANTEMP	0.021** (2.66)	0.009** (3.28)
TOXICHEMR	-0.0088* (-2.37)	-0.003* (-2.25)
STPKSPC	0.498** (3.92)	0.13** (3.34)
R^2	0.75	0.77
$adjR^2$	0.70	0.73
F	15.01**	17.37**

Terms in parentheses are t-values. **indicates statistically significant at the 1% level; *indicates statistically significant at the 5% level.

Table 6. Further Empirical Results: Economic Freedom, Total Freedom

Dependent Variable *NETMIGRRATj*	*Log NETMIGRRATj*	*NETMIGRRATj*	*Log NETMIGRRATj*
Variable\Coefficient (a)	(b)	(c)	(d)
Constant 1.94	0.82	1.67	0.72
EXPPCPERSINC 0.0000007**	0.0000002**	0.0000007***	0.000003**
(3.02)	(3.66)	(3.54)	(3.99)
COSTOFLIV -0.016**	-0.0066**	-0.168**	-0.0069**
(-3.45)	(-4.64)	(-3.73)	(-4.97)
STLOPROTXPC -000001*	-0.00003*	-0.00007*	-0.00003**
(-2.20)	(-2.59)	(-2.36)	(-2.78)
STINCTAXR -0.102*	-0.0299*	-0.09*	--0.026*
(-2.28)	(-2.42)	(-2.04)	(-2.09)
ECONFREE 1.05*	0.385**	-------	-------
(2.53)	(2.82)		
TOTALFREE -------	-------	0.97**	0.347**
		(2.71)	(2.79)
AVEJANTEMP 0.047**	0.017**	0.047**	0.017**
(3.78)	(4.38)	(3.68)	(4.22)
TOXICHEMR -0.0079*	-0.003*	-0.0075*	-0.0026*
(-2.18)	(-2.03)	(-2.25)	(-2.04)
STPKSPC 0.557**	0.146**	0.51**	0.129**
(3.91)	(3.41)	(3.38)	(3.96)
COASTj -0.38	-0.094	-0.38	-0.096
(-1.52)	(-1.29)	(-1.53)	(-1.25)
CDDj -0.0003*	-0.0001**	-0.00031*	-0.00009**
(-2.47)	(-2.83)	(-2.48)	(-2.77)
HAZARDPCTj -0.134*	-0.52*	-0.13*	-0.05*
(-2.43)	(-2.41)	(-2.46)	(-2.43)
R^2 0.79	0.81	0.79	0.81
$adjR^2$ 0.72	0.75	0.73	0.75
F 12.61**	14.52**	12.87**	14.71**

Terms in parentheses are t-values. **indicates statistically significant at the 1% level; *indicates statistically significant at the 5% level.

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