REESTIMATING THE REMI MIGRATION EQUATION COEFFICIENTS TO CORRECT FOR ENDOGENEITY

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INTRODUCTION

Do people follow jobs or do jobs follow people? If the former is the case, then one would conclude that economic factors are the main driver of migrants into an area. In this case, people will move to a region if they expect to receive higher compensation rates in that region and are more likely to find employment there. Compensation includes not only wages but insurance and pension benefits. Conversely, if the latter is the case and jobs follow people then non-economic factors such as amenities take precedence for would-be migrants. As such, quality of life factors such as environmental attractiveness, public safety, and education, play a more important role in people's decision to relocate to an area. Firms then follow people in order to sell to a larger consumption market and also to draw upon a larger labor pool with a diverse skill set.

Determining the extent to which economic factors versus amenities play in an individual's decision to migrate to an area is not solely interesting from a theoretical perspective. The relative significance of compensation rates and economic opportunity versus amenities also have real public policy implications. For local and state governments striving to create jobs and stimulate their economies, it is important to know what kind of economic development policy to follow. More specifically, governments need to make a decision on whether to invest tax dollars in making their region more environmentally and family friendly, thereby attracting would-be workers or entrepreneurs who care about the quality of life. Or are they better served by providing various economic incentives to firms to move to the region, thereby increasing investment and generating additional employment. Given the limited resources that are available to local and state governments especially at a time of serious budget constraints, it is crucial that taxpayer money is invested wisely. This means a strategy needs to be adopted that will generate the most bang per public buck in terms of jobs and tax revenue.

In this paper, we utilize the instrumental variable approach to estimate the model coefficients of the REMI Migration Equation for the time period 2001–2008. This equation measures the sensitivity of the net economic migration rate in the 50 U.S. States and D.C. to 3 factors. One, Real Relative Compensation Rates (RWR), which is denoted RWR because the previous REMI compensation measurement only accounted for wages. Currently RWR measures compensation which, as mentioned, includes not only wages but insurance and pensions. Two, the equation includes Relative Employment Opportunity (REO). Three, Regional Amenities are the fixed effect in the REMI Migration Equation. The amenity effect quantifies the relative attractiveness of different states. By using valid and strong instruments for RWR and REO, we obtain more accurate model coefficients. Thereby, we are able to measure more accurately the response of economic migrants to changes in employment opportunity and compensation rates.

By using instruments that are related to the independent variables but not correlated with the error term, we solve 2 problems: 1) endogeneity in economic relationships 2) omitted variables bias. In the presence of these problems, OLS will generate biased and inconsistent estimates. Endogenity refers to the fact that while RWR and REO have an effect on the economic migration rate (as posited by the REMI Migration Equation), the reverse is also true. In other words, an inflow (or outflow) of economic migrants impact compensation rates and employment opportunity in that region as well. For example if Austin, Texas experiences an inflow of computer engineers seeking employment at Dell then RWR is forced down. In order to tackle this identification problem and make sure that our model coefficients in fact identify the response of economic migration rate to changes in RWR and REO, we use 2SLS, which is an instrumental variable technique.

The instruments we consider come from PI+ V.1.2, a full multiregional, macroeconomic impact model produced by REMI. We construct two instruments to be included in the IV equation: The industry mix wage rate and industry mix employment. And through formal validity and strength tests choose federal military spending as an instrument. Other instruments we considered but ultimately eliminated are international migrants, college population, relative fuel costs, personal current tax rate, mining employment (as a share of labor force), retired migrants (as a share of labor force), and defense spending (as a share of state output).

The intercept λ gives the fixed amenity term for each state that measures the amenity effect. Amenities are defined as natural and man-made factors. Natural amenities measure the attractiveness of climate and environment. On the other hand, man-made amenities are a function of the provision of the health, education, safety and recreation that help determine the quality of life in a region. These factors are not explicitly stated in the equation, but they do enter a individual's decision to relocate to an area. Therefore, amenities are an important variable that need to be included in a migration equation.

1. MODEL VARIABLES

The REMI Migration Equation is given in 1.1:

$$ECMG_t^k \;/\; LF_{t-1}^k = \lambda^k + ß_1 * \ln(REO_t^k) + ß_2 * \ln(RWR_t^k) + 51 \text{ dummies} + u \qquad \boxed{1.1}$$

The dependent variable in equation 1.1 is the net economic migration rate (NECM), which is obtained as a ratio of net economic migrants (ECMG) at time t to labor force (LF) at time t-1 in region k: $ECMG_t^k \;/\; LF_{t-1}^k$

The two independent variables are relative employment opportunity and real relative compensation rates. The relative employment opportunity (REO), given by equation 1.2, is defined as the ratio of residence adjusted employment to labor force at time t in region k divided by the ratio of residence adjusted employment to labor force at time t in the whole nation.

$$REO = (E_t^k \;/\; LF_t^k) \;/\; (E_t^u \;/\; LF_t^u) \qquad \boxed{1.2}$$

The real relative compensation rate (RWR) is defined as the ratio of the local average compensation rate at time t in region k to the average industry compensation weighted by the employment industry shares at time t in region k. The ratio is multiplied by the ratio of real disposable income (RYD) to personal income (YP) at time t in region k relative to that of the nation. Equation 1.3 formally defines local average compensation rates and equation 1.4 defines average industry compensation weighted by the employment industry shares in k.

$$CR_t^k = \sum_{i=1}^{n} E^k_{i,t} / TE^k_{i,t} * C^k_{i,t} \qquad \boxed{1.3}$$

$$CR_t^u = \sum_{i=1}^{n} E^k_{i,t} / TE^k_{i,t} * C^u_{i,t} \quad (1.4)$$

Where E is the employment at time t in region k for industry i, TE is the total private non-farm employment at time t in region k, and C is the compensation rate at time t in region k for industry i. Now, the real relative compensation rate RWR, can be formally defined in equation 1.5.

$$RWR = (CR_t^k \; / \; CR_t^u) \; * (RYD_t^k / YP_t^k) / (RYD_t^u \; / \; YP_t^u) \quad (1.5)$$

Finally, the equation contains a dummy variable i for each of the 50 states and Washington D.C. The dummies generate an amenity value for each region once the regression analysis is run. The amenity is captured by λ^k, the 51 intercepts given by the 51 dummy variables estimate the regional constant. The compensating differential is then calculated from the regional constant. The formula is given by equation 1.6.

$$\text{Compensating Differential} = \text{EXP}\ (-1.0 * \text{Regional Constant} / \beta) \quad (1.6)$$

β refers to the average of model coefficients for REO and RWR obtained via the IV regression. The Compensating Differential gives the amenity value in a region.

2. NATURE OF THE PROBLEM: WHY USE IV INSTEAD OF OLS

Using OLS in the presence of endogeneity to estimate the REMI migration equation gives biased and inconsistent estimators. OLS assumes the independent variables drive the dependent variables. The dependent variable, net economic migrants, may not affect relative employment opportunity and/or relative real compensation rates. If the dependent variable drives the independent variables the equation suffers endogeneity because of reverse causality.

Consider the following example to illustrate a possible cause of reverse causality in the REMI Migration equation. Say a new Toyota plant opens in Mississippi and the state experiences a net inflow of economic migrants. The new engineers in Mississippi bring their families along, expanding the consumer market in the area. As the needs of the new population need to be satisfied, additional business and employment opportunities are generated in the service sector. In this case, net positive economic migration clearly changes relative employment opportunity.

Econometrically, we detect reverse causality in the REMI migration equation by regressing REO on the dependent variable and all other exogenous variables. If the parameter estimate on net economic migrants is statistically significant, then there is reverse causality. If this is the case, OLS gives biased and inconsistent estimators. In other words, OLS will generate an inaccurate prediction of the effects of REO and RWR on migration.

The parameter estimate and t-statistic for net economic migrants in Table 1 indicate that economic migration is in fact correlated with REO.

Table 1: REO Reverse Causality

Variable	Parameter Estimate	t-statistic	Pr > |t|
ECMG	.22368	3.74	.0002

Does net economic migration affect relative real wage? Let us continue the previous example. Net positive economic migration to Mississippi arising from a new Toyota plant increases the size of the regional labor force. Not all of the migrants will come to the region for jobs at the Toyota plant. Potential migrants hear of the growth in Mississippi and relocate to fill intermediate or service roles to the developing region. It is conceivable that this may serve to depress the relative real wage. While the new engineer and manufacturing wages increase aggregate wages, the surfeit of service labor depresses low skill wages. We econometrically test reverse causality between RWR and net economic migrants by regressing the relative real compensation rate on the dependent variable and all other exogenous variables. We find that net economic migrants drive RWR as well. The resulting reverse causality is shown below in Table

Table 2: Reverse Causality RWR

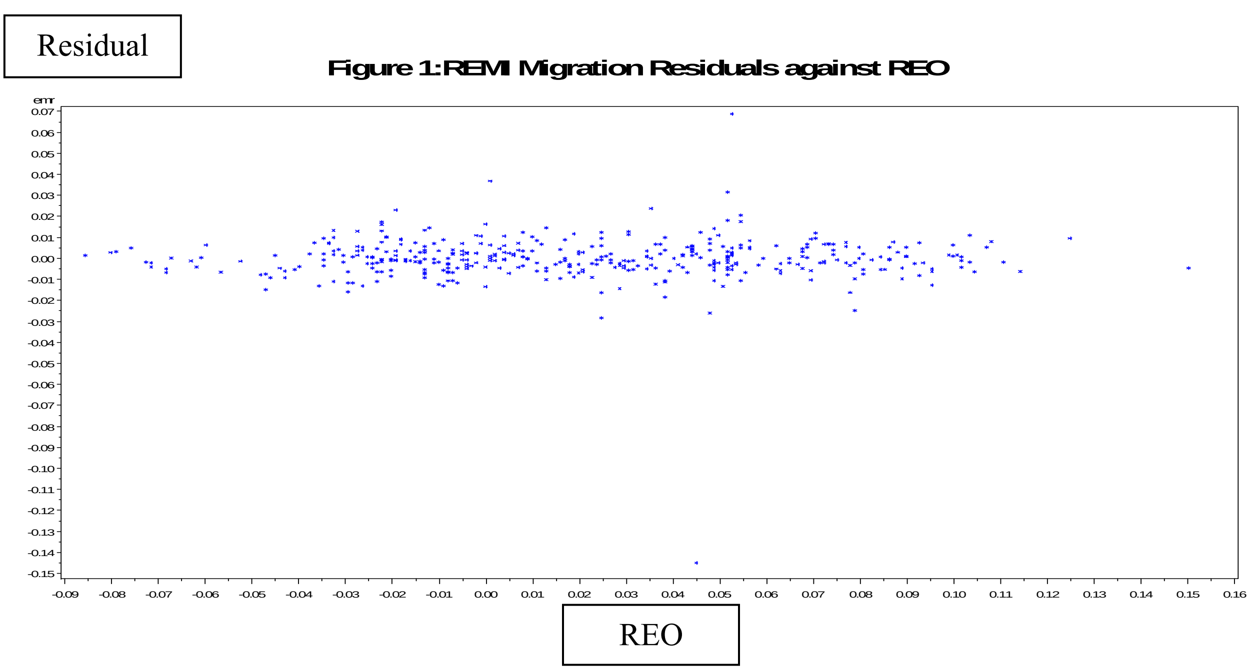
Variable	Parameter Estimate	t-statistic	Pr > |t|
ECMG	.25007	4.11	< .0001

We see that the two regressors in this equation, REO and RWR, cannot be exogenous and an alternative method to OLS is needed. The IV approach provides a solution to this problem by introducing instrumental variables (z) for the endogenous regressors. These instruments have the following properties. Changes in z are associated with changes in x but do not lead to changes in y. Additionally the instrument must not be correlated with the residuals. There are 2 possible IV techniques we consider; GMM (General Method of Moments) and 2SLS (2 Stage Least Squares). The following section explains why we choose 2SLS. After deciding on a method, we gather a pool of valid and strong instruments and present new unbiased and consistent estimates of the effects of REO and RWR on economic migration.

3. THE CHOICE BETWEEN 2SLS AND GMM

Both GMM and 2SLS can estimate the REMI Migration using instrument variables. OLS cannot handle the use of instrument variables. The choice between 2SLS and GMM requires an examination of the relationship between the variance of the disturbances and the regressors. If the relationship is homoskedastic 2SLS is preferable to GMM. Conversely, if the relationship is heteroskedastic GMM is preferable to 2SLS. A graphical check is necessary but not sufficient to determine the nature of the relationship. Figure 1 plots the REMI Migration Equation OLS residuals against relative employment opportunity.

Figure 1:REMI Migration Residuals against REO



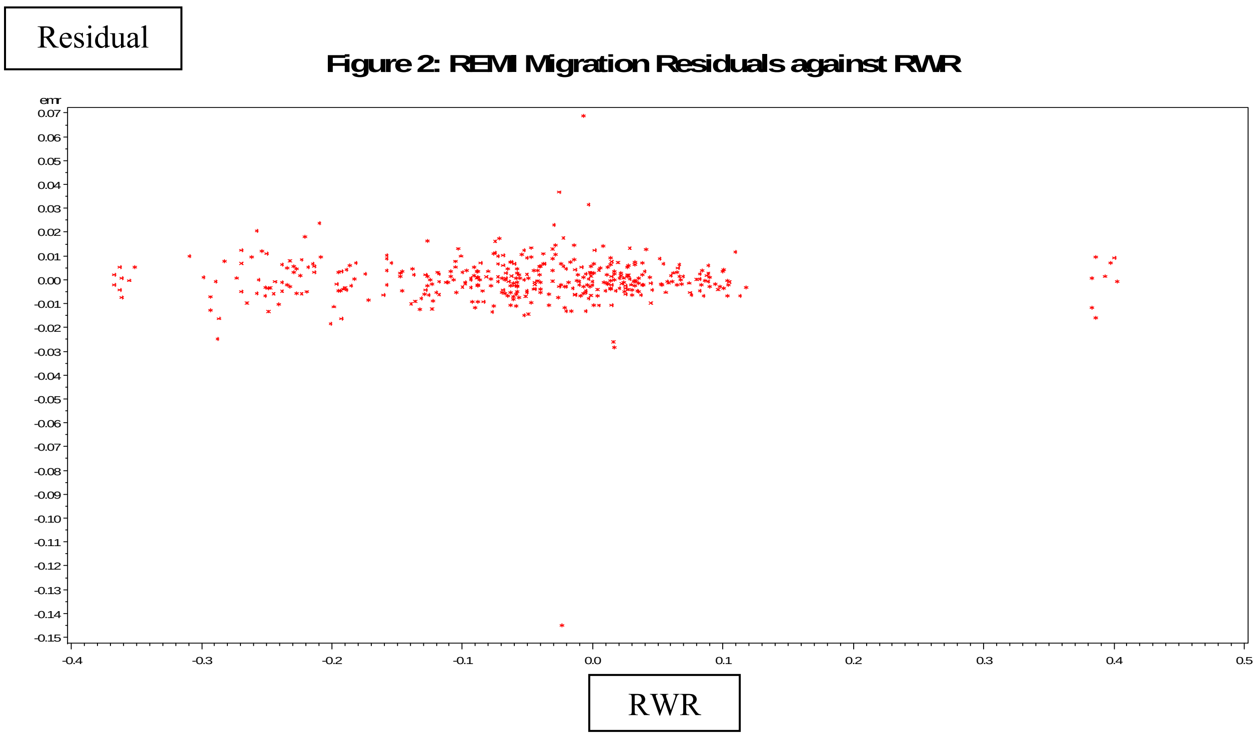


Figure 2 plots the REMI Migration Equation OLS residuals against the relative real compensation rate. If the plots exhibited "ballooning" then the relationship is heteroskedastic. When the variance is not constant and changes over time, we need a heteroskedastic estimator, which is provided by GMM. The plots for both REO and RWR exhibit clustering, thus the relationship is homoskedastic and we choose 2SLS over GMM.

Below is the necessary White Test for heteroskedasticity.

Table 3: White Test for Heteroskedasticity

Equation	**Test**	**Heterosk Stat.**	**Pr > ChiSq**	**Type**
ECMG	White	118.1	0.9877	Cross/Sq all Var.

A formal test for heteroskedasticity is the White Test, which takes into account the cross product and squares of all variables in detecting heteroskedasticity. The null hypothesis here is "No Heteroskedasticity". According to the Heteroskedasticity Statistic and Pr > ChiSq we resoundingly *fail* to reject the null hypothesis and conclude the relationship between the REMI Migration equation residuals and regressors is homoskedastic. Now that the estimation technique is determined we present a discussion of possible instruments for REO and RWR.

2SLS, 2-stage Least Squares Estimation, is a special case of GMM. 2SLS combines multiple instruments into one optimal instrument, which is then used in the IV estimator. In the first stage, endogenous regressors are regressed on instruments. In the second stage, OLS regression is run using the predicted values of regressors. This gives us consistent estimations of coefficients in a model where regressors and error term are correlated.

The 2SLS is expressed formally in equation 3.1 as:

3.1

1st Stage

$$\ln(REO_t^k) = \lambda^k + ß_1*(EMX_t^k) + ß_2*(WMX_t^k) + ß_3*(FM_t^k) + ß_4*(INTM_t^k) + \varepsilon$$

$$\ln(RWR_t^k) = \lambda^k + ß_1*(EMX_t^k) + ß_2*(WMX_t^k) + ß_3*(FM_t^k) + ß_4*(INTM_t^k) + \varepsilon$$

2nd Stage

$$(ECMG_t^k \ / \ LF_{t-1}^k) = \lambda^k + ß_1*\ln(REO_t^k) + ß_2*\ln(RWR_t^k) + \varepsilon$$

Here, EMX is the employment mix variable, and WMX is the wage mix variable. These are constructed instruments for REO and RWR. FM is Federal Military Employment (as a share of the Labor Force) which, as the paper will discuss, is a valid and strong instrument.

4. Instrument Choice

Given that we have found both of our regressors to be endogenous, instrumental variable estimation is preferable to an Ordinary Least Squares (OLS) regression. In order to do so, valid and relatively strong instruments need to be identified. Before we test instrument validity and weakness, however, instruments for the regressors have to make intuitive sense. Below we provide a theoretical justification for the variables we consider as instruments for relative employment opportunity and real relative compensation rate, some of which were subsequently excluded from the 2SLS estimation.

For real relative compensation rate, we considered relative fuel costs, the consumer price index, and personal current tax rate in addition to the wage mix variable that was constructed. The data for all 4 instruments come from the REMI PI+ model, which is a regional macroeconomic model used for economic impact analysis.

RWR is the average compensation rate without the effect of the industry mix adjusted for the cost of living in a region. Relative fuel costs and personal current tax rate are thus related to the compensation rate to the extent that the regional compensation rate compensates a would-be migrant for the higher fuel and/or tax costs. Similarly, consumer price index combines a variety of good prices that should theoretically approximate the purchasing power by the regional compensation rate.

The relative employment opportunity refers to the probability of finding employment in a given state. We considered instrumenting for REO with college population as a share of state population, international migrants as a share of the labor force, federal military employment, defense spending estimated as a share of state output, in addition to the employment mix variable that was constructed. The REMI PI+ model provides the data for these instruments. Military employment certainly has an effect on employment opportunity, but is not related to economic migration directly.

As REO is endogenous to the same demand shocks that impact net economic migration flows, we need to instrument for this regressor. The primary instrument for REO is the state industry mix employment growth rate, EMX. This variable is defined as the initial-year state employment share of each of the 70 industries in our dataset multiplied by the national growth rate in each industry, and then summed across all industries, generating one value for each year for each state. This estimation gives the hypothetical rate of employment growth if a given state's industries grow at the same rate as the national average during the sample period. Thus, changes in national industry demand act as an exogenous shifter.

EMX is an ideal instrument to tackle the endogeneity problem because the national growth rate of industries is uncorrelated with net economic in and out migration of a specific state. If a state has a larger share of industries that are growing faster nationally, then its regional employment growth rate will be higher. By contrast, states with nationally ossified industries will have a lower rate of employment growth. National industry demand only affects migration to the extent that it affects local employment opportunity. Economic migration to a region, on the other hand, will not change the rates of industry growth nationally.

Similarly, we instrument for RWR because changes in compensation rates could also be affected by demand shocks and therefore could be endogenous. The primary instrument for RWR is the analogous wage mix variable. This variable is defined as the initial-year industry employment share of each state industry multiplied by the national wage level in each of the 70 industries we include in the dataset, and then summed across all industries. The values generated in this fashion give us the hypothetical state wage rate if each state industry paid its employees the national average wage for that industry. As such, national wage differences across industries become the exogenous shifters. Industrial wage differences between states act as a major magnet for would-be economic migrants. By using the hypothetical state average wage rate that would have prevailed if each state industry paid the national wage rate, we ensure that migrants will not in turn influence the wage rate.

5. Instrument Validity

We use econometric tests to narrow the list of possible instruments. The above instruments are intuitively correlated (positively or negatively) with the endogenous independent variable and uncorrelated with the residuals. From the following method we determine which of the candidates satisfy the necessary correlation condition for statistically sound instruments.

5.1

$\ln(REO_t^k) = ß_1 * \ln(RWR_t^k) + ß_2 * (FM_t^k) + ß_3 * (EMX_t^k) + ß_4 * (INTM_t^k) + ß_5 * \ln(WMX_t^k) + 51\text{Dummies} + \varepsilon$

The above regression results illustrate the invalidity of an instrument. To check if the proposed instrument international migrants (INTM), is correlated with REO we simply regress REO on INTM and all other instruments and independent variables. If the parameter estimate on INTM is statistically insignificant at 95%, or statistically significant with a parameter estimate close to zero, then we conclude INTM is an invalid instrument. The regression results clearly show that INTM is not a valid instrument for REO.

Table 4: Instrument Validity International Migrants

Variable	**Parameter Estimate**	**t-statistic**	**Pr > |t|**
INTM	-0.55466	-0.96	0.3402

On the other hand, regression 5.2 demonstrates that federal military employment (FM) is a valid instrument. Regressing REO on the instrument FM and all other independent variables yields the necessary results. The parameter estimate is not close to zero and it is statistically significant at 95%. Therefore, FM passes the first validity test.

5.2

$$\ln(REO_t^k) = ß_1*\ln(RWR_t^k) + ß_2*(FM_t^k) + ß_3*(EMX_t^k) + ß_4*\ln(WMX_t^k) + 51 \text{ Dummies} + \varepsilon$$

Table 5: Instrument Validity Federal Military

Variable	**Parameter Estimate**	**t-statistic**	**Pr > |t|**
FM	.17356	2.51	0.0124

Below, we present the second part of the instrument validity test that checks whether FM is *uncorrelated* with residuals. First, we run the OLS regression for the REMI migration equation and obtain the residuals. Next, we regress the residuals on the proposed instrument and all other independent variables. The parameter estimate on FM must be statistically insignificant for FM to be *uncorrelated* with the residuals. The regression results are given in Table 6.

5.3

$$u = ß_1*\ln(RWR_t^k) + ß_2*\ln(REO_t^k) + ß_3*(FM_t^k) + ß_4*(EMX_t^k) + ß_5*\ln(WMX_t^k) + 51 \text{ Dummies} + \varepsilon$$

Table 6: Instrument Validity Federal Military

Variable	**Parameter Estimate**	**t-statistic**	**Pr > |t|**
FM	0.04998	0.81	0.4202

The results above indicate that FM is correlated with REO but *uncorrelated* with the residuals. Therefore, we conclude that FM is indeed a valid instrument. This process is repeated with sound results for EMX and WMX, thus they are valid instruments.

6. Instrument Strength

Once we gather a list of valid instruments, the next step is determining which are strong enough to be included in the model. In a formal test of instrument strength, we implement a redundancy test. We examine whether the large-sample efficiency of the estimation is improved by including a specific instrument in the model. The test statistic estimated by the redundancy test is a likelihood-ratio statistic based on correlations from 2 cases: one with the instruments being tested and one without. The null hypothesis is that the specified instrument(s) is redundant. We compare the test statistic to the chi-square distribution value with degrees of freedom given by the endogenous regressors times the number of instruments tested. The test assumes that the regressors are distributed multivariate normal. Failure to reject the null hypothesis means that a given instrument is redundant. Accordingly, we conclude that the instrument provides no useful information towards identifying the equation. The results are shown in Table 7.

Table 7: Instrument Strength Redundancy Test

Redundancy	**Statistic**	**P-Value**
FM	7.239	.0268
INTM	2.495	.2872
LNWR	38.094	.0000
EMX	14.920	.0006

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In addition to redundancy test, we also undertake the Stock and Yogo test for weak instruments. We compare the test statistic to the F-statistic for joint significance of instruments in the first-stage regression of regressor on all instruments. A widely used rule of thumb is that an F statistic of less than 10 indicates weak instruments.

More formally, the Wald test compares the F statistic against a critical value with a minimum Eigen value and a tolerance for the size distribution of this test. As could be seen from the results, INTM is not a strong instrument. The other 3 instruments, FM, EMX, and WMX are relatively strong. The results are shown in Table 8.

Table 8: Instrument Strength Wald Test

Wald	F-statistic	p-value
ln(RWR)	3.553	0.0074
ln(REO)	4.7728	0.0009

2SLS Results

The REMI Migration equation is estimated by 2SLS using the instruments FM and EMX for REO and WMX for RWR. The new estimates of the affects of relative employment opportunity and relative real compensation rates on net economic migrants are unbiased and consistent.

Table 9: REMI Migration Equation 2SLS

Variable	Parameter Estimate	t-statistic	Pr > |t|
ln(REO)	0.303048	2.05	0.004
ln(RWR)	0.412279	2.65	0.008

Both parameter estimates for ln(REO) and ln(RWR) are significant. These parameter estimates or coefficients can be interpreted as follows. A 1% change in relative employment opportunity leads to an estimated .30 % change in net economic migration. Similarly, a 1 % change in the relative real compensation rate induces a .41 % change in net economic migration to a region.

By contrast, estimating the REMI Migration equation by OLS yields significantly lower coefficients. When estimated by OLS a 1% change in relative employment opportunity results in a .17 % change in net economic migration. On the other hand, a 1% change in the relative real compensation rate results in a .18% change in the number of migrants. These results are clearly less accurate as they are the product of a biased and inconsistent estimation technique.

Ultimately is the 2SLS method an improvement over the OLS estimation of the effects of REO and RWR on economic migrants? The null hypothesis in the Hausman Test is that OLS is efficient, alternatively 2SLS is consistent. The Hausman Test results below confirm that 2SLS is superior to OLS. Table 10 shows the null is rejected at all significance levels in favor of the consistency of 2SLS.

Table 10: Hausman Test

Efficient Under Ho	**Consistent Under H1**	**Statistic**	**Pr > ChiSq**
OLS	2SLS	11.38	0.0034

7. Amenity Value Results

Amenities are estimated in our model by the intercept term λ^k. For each state, we obtain regional constants through IV estimation. These constants are then plugged into equation 7.1 yielding the compensating differentials:

$$\text{Compensating Differential} = \text{EXP}\,(-1.0 * \text{Regional Constant} / \beta) \qquad (7.1)$$

A positive regional constant generates a compensating differential value of less than 1. In this case, the state is classified as a positive amenity state. Conversely, a negative regional constant produces a compensating differential that is more than 1. This indicates a negative amenity state. The amenity values estimated by our model are generally in line with conventional wisdom regarding the natural attractiveness of states. The state amenity values are shown in table 11 as follows:

Table 11: State Fixed Effect Amenities

STATE	Regional Constant	Compensating Differential
Alabama	0.02044	0.9296
Alaska	0.0341	0.885339
Arizona	0.035156	0.882006
Arkansas	0.0532	0.826958
California	0.014092	0.950916
Colorado	0.016689	0.942137
Connecticut	-0.04894	1.191012
Delaware	0.007152	0.974781
District of Columbia	-0.17582	1.873722
Florida	0.015142	0.947359
Georgia	0.014259	0.95035
Hawaii	0.079342	0.753247
Idaho	0.109593	0.676108
Illinois	-0.0447	1.173109
Indiana	-0.00773	1.027995
Iowa	0.024528	0.916128
Kansas	0.011592	0.959445
Kentucky	0.029486	0.900048
Louisiana	-0.01286	1.046989
Maine	0.069996	0.778812
Maryland	-0.03392	1.12877
Massachusetts	-0.04282	1.165256

Michigan	-0.01802	1.06646
Minnesota	-0.00777	1.028147
Mississippi	0.044749	0.8523
Missouri	0.003667	0.98699
Montana	0.134826	0.617843
Nebraska	0.014708	0.948826
Nevada	0.02354	0.919366
New Hampshire	0.002195	0.992192
New Jersey	-0.06264	1.250734
New Mexico	0.066919	0.787419
New York	-0.02241	1.083333
North Carolina	0.030405	0.897098
North Dakota	0.05772	0.813717
Ohio	-0.00956	1.034725
Oklahoma	0.026654	0.909198
Oregon	0.072156	0.772827
Pennsylvania	-0.00838	1.030375
Rhode Island	0.034155	0.885166
South Carolina	0.030214	0.897711
South Dakota	0.082275	0.745396
Tennessee	0.003319	0.988218
Texas	-0.0381	1.14576
Utah	0.08385	0.741215

Vermont	0.077453	0.758344
Virginia	-0.02263	1.084179
Washington	0.012302	0.957015
West Virginia	0.03471	0.883413
Wisconsin	0.020841	0.92827
Wyoming	0.077339	0.758652

A quick glance at this table shows that the western and southern states have higher amenity values. States such as Montana, Idaho and Utah are often regarded as having an attractive climate and environment. They feature higher in the amenity table compared to states in the Northeast and the Midwest. In fact, the 5 areas with the poorest amenities are DC, New Jersey, Connecticut, Illinois and Massachusetts. These states are often regarded as congested urban areas that do not offer many recreational opportunities.

Conclusion

Given the detected economic endogeneity in the relationship between economic migration and the regressors REO and RWR, we have used the instrumental variable technique 2SLS in this paper to estimate the sensitivity of net economic migration to employment opportunity and compensation rate for 50 US states plus DC for the time period 2001-2008. Because the errors are homoskedastic, we have decided to use 2SLS, a special IV approach. By using valid and relatively strong instruments, we obtained accurate, unbiased, and consistent model coefficients that represent a significant improvement over the standard OLS technique. Thus, we have been able to distinguish between the relative significance of economic factors such as compensation and employment opportunity vs. non-economic factors such as amenities in a would-be migrant's decision to relocate to a region.

Our analysis shows that overall relative employment opportunity (REO) is the most important factor that induces people to move between states. The real relative compensation rate

(RWR) has a relatively lower impact on people's decision on where to relocate. However, both are significant factors that determine whether a state is an in or out migrant state.

We have also found that amenities contribute to a state's attractiveness to migrants. Amenity values differ significantly across states. The western and southern states score high on the positive amenity index as expected. States such as Montana and Utah have a low population density and a wide range of natural parks. They also tend to be more family-friendly. By contrast, the states in the Northeast and Midwest have negative amenity values. For example, New Jersey and Connecticut rank very low on the index due to their congestion and environmental pollution. The relatively higher level of crime and lower quality of education and health make them less attractive from an amenity perspective.

Positive amenity states such as Montana and Idaho are net positive in-migration states. Thus, the positive effects of a high amenity score outweigh the lower prospects of employment and lower wages. In other words, amenities pull in more migrants than economic factors push out. Negative amenity regions such as D.C., New Jersey, and Connecticut on the other hand, may be in-migrant or out-migrant states. In other words, the pull of better employment prospects and/or higher wages may or may not be sufficient to counter the push of negative amenity effects of congestion, pollution, and crime. Depending on the relative importance of economic factors versus amenities in the negative amenity states, state and local governments may need to focus their economic development efforts on improving quality life or attracting businesses to their region.