FISCAL HARMONIZATION AND MIGRATION IN THE EUROPEAN UNION

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ABSTRACT:
The focus of this paper is the impact of fiscal policies on international migration flows. The Tiebout hypothesis proposes that individuals consider differences in tax rates and social spending when making migration decisions. While evidence of the Tiebout hypothesis has been found in several domestic U.S. and Canadian studies, this is the first paper to test the Tiebout hypothesis using bilateral international migration flows. The Maastricht treaty has created a unique opportunity to study migration in an international context by removing legal barriers to migration within the European Union. Using data from EU countries throughout the 1980s and 1990s, this paper finds significant statistical support for the Tiebout hypothesis with regards to international migration flows. These results suggest that achieving greater fiscal harmonization across countries would lower migration flows. The results also imply that EU countries which are resistant to achieving fiscal harmonization with members may, as a result, have problems in attaining their other goal of reducing immigration (inward) from these countries.

JEL CLASSIFICATION: F1, F2.

KEYWORDS: Migration, European Union, Fiscal Surplus, Taxes, Social Spending.

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INTRODUCTION

Migration is a major issue for countries both in the European Union (EU) and around the world. Globally, the number of international migrants has been increasing for decades, more than doubling since 1970 (United Nations, 2006). Migration within the European Union has also increased. Many Western European nations are concerned that a large East-West migration will occur as the EU continues to expand eastward. In fact, a recent Allensbach Institute poll found that 46 percent of Germans reported increased immigration as their greatest concern (Martin, 2005).

It is common for countries to have significant barriers to immigration. Countries regularly attempt to manage inflows of migrants in order to assure that their labor and housing markets, infrastructure and government services are not overwhelmed. Usually, governments can set limits on the number of immigrants allowed to enter, leaving the primary challenge being dealing with illegal immigration. However, in the case of the European Union, member countries can no longer directly control migration flows from other EU nations; all barriers to migration between member nations have been removed (there are some temporary restrictions on labor inflows from new EU entrants, but these have to be phased out within seven years of a country’s entry).1 European governments attempting to control migration flows must now focus on other factors within their control that may impact migration.

While European Union governments no longer have independent monetary and immigration policies, they do still control their own tax rates and social spending, taking of course into account some fiscal restrictions required (budget deficit and government debt as conditions for the common currency, etc). Tiebout (1956) proposes that individuals consider governmental tax and social spending policies in their migration decisions. Individuals choose to locate in an area with government policies that match their preferences. Considerable research has been done on this hypothesis with regards to domestic migration within the United States and Canada. Since a full review of this literature is beyond the scope of this paper, readers are directed to Dowding and John (1994) for a survey of the empirical literature on the Tiebout hypothesis. Some examples of the empirical Tiebout research includes papers such as Buchanan and Goetz (1972), Cebula and Karoglis (1986), Cushing (1993), Day (1992), Day and Winer (2001), Flatters et al. (1974), Koven and Shelley (1989), Ott and Shadbegian (1993), Shaw (1986) and Starrett (1980). Some of the research more specifically focused on testing the Tiebout hypothesis by using the movements of welfare recipients include Brehm and Saving (1964), Cebula (1974), Dye (1990) and Pack (1973). Liebig and Sousa-Poza (2005) examined the Tiebout hypothesis using data from migrants in different parts of Switzerland. Twomey (1987) and Cuthbertson et al (1982) tested the Tiebout hypothesis by using data from different boroughs in the United Kingdom. Some of the more theoretical papers on the Tiebout hypothesis include Konishi (1996) and Nechyba (1997). Ott (1992) provides a descriptive, rather than econometric, examination of fiscal differences and migration flows in Europe.

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1 The free flow of labor is true of all of the EU 15 countries in this paper.
There are large fiscal differences between the 15 old European Union countries and the 10 newest member countries. Figure 1 shows a fiscal comparison of the old and new EU countries. The variable shown is a ratio of government revenues as a percentage of GDP divided by government spending as a percentage of GDP (Eurostat, 2005).

**FiguRe 1. Taxes/Expenditures**

Note: Mean per capita social expenditure is $6,309 and the average effective tax rate is 34%.

These significant fiscal differences between the old and new EU members suggest that the Tiebout hypothesis may be especially relevant to the case of the European Union.2

Despite the considerable testing of the Tiebout hypothesis using data from migrants within a country, it has never been tested using migrant flows between countries. This paper utilizes the unique opportunity presented by the EU to test the Tiebout hypothesis using data from bilateral migration flows between several countries without legal barriers. Using data from the 1980s and 1990s, this paper finds significant evidence of the Tiebout hypothesis with respect to the countries of the European Union. These results suggest that European countries do still have effective policy tools to affect migration flows.

For those interested readers, the first section of the paper develops a theoretical model of migration that incorporates fiscal factors. This is followed by a discussion of the data set and the variables used in the analysis. The empirical methodology is then explained and the results discussed. The paper concludes with some comments concerning the paper’s implications for public policy and migration.

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2 It should be noted that the figure appears similar when the revenue and expenditure variables are considered separately, rather than as a ratio.
1. THEORETICAL MODEL

This section develops a migration model that incorporates fiscal factors. Migration is modeled as the decision of a utility maximizing agent. The work of Nakosteen and Zimmer (1980) provide a basis for the theoretical model. The model is based on individuals maximizing their utility derived from the consumption of a bundle of private and public goods. We assume individuals believe their migration decision has no effect on the distribution of the tax burden or the consumption of public goods among the citizens of the origin and destination countries.

The individual has full information regarding his/her income in the “origin country”. The individual forms an expectation of his/her income in a potential migration destination based on the probability of being unemployed, the wage rate and the tax rate. For simplicity, we assume the cost of moving to be negligible.\(^3\)

The individual’s utility function is given by

\[ U_j^i = U^i \left( X_j, G_j \right) \]  

where \( X_j \) and \( G_j \) are the vectors of private and public goods in country \( j \), respectively. The variable \( j \) is defined as \( j = A, B \) with \( A \) being the origin country and \( B \) the destination country. Individual \( i \)’s demand for private goods is

\[ X_j = X \left[ E(I_j), P_j \right] \]  

where \( E(I_j) \) is the expected income of individual \( i \) in country \( j \) and \( P_j \) is the aggregate price level in country \( j \). We assume that there is no income uncertainty in the origin country, so expected income in the two countries is given by \( E(I_A) = I_A \) and \( E(I_B) = E(I_B) \).

Individual \( i \)’s indirect utility functions are

\[ V_B^i = V^i \left[ E(I_B), P_B, G_B \right] \] for the destination country \( (j=B) \), and \( V_A^i = V^i \left[ I_A, P_A, G_A \right] \) for the origin country \( (j=A) \). \[ (3a) \]

\[ (3b) \]

The indirect utility function is homogeneous of degree zero with respect to its arguments, so we can divide by \( P_j \) to yield the equations

\[ V_B^i = V^i \left[ \frac{E(I_B)}{P_B}, \frac{G_B}{P_B} \right] = V^i \left[ \frac{E(I_B)}{P_B}, \frac{G_B}{P_B} \right] \] \[ (4a) \]

\[ (4b) \]

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3 This assumption is dropped in the empirical section. The empirical results find distance to have a negative impact on migration.
Expected disposable income in equation (4a) is given by

\[ E(I_B) = (1 - \rho_B)w_BL_B - t_BB_B \]  

(5a)

with \( B_B < w_BL_B \), where \( w_B \) is the average wage in country \( B \), \( L_B \) is the number of hours worked, \( \rho_B \) is the probability of being unemployed, \( t_B \) the tax rate and \( B_B \) is the tax base. Assuming \( L_B \) to be fixed, a person’s expected income will depend on the probability of being unemployed, his/her wage rate and the tax rate. Disposable income in equation (4b) is

\[ I_A = w_AL_A - t_APB_A \]  

(5b)

with \( B_A < w_AL_A \). Assuming that \( L_A \) is fixed, by substituting equations (5a) and (5b) into equations (4a) and (4b) we can rewrite the indirect utility functions as

\[ V_B^i = V^i \left[ \frac{(1 - \rho_B)w_B}{P_B} - \frac{t_BB_B}{P_B} \right] \frac{G_B}{P_B} \]  

(6a)

\[ V_A^i = V^i \left\{ \frac{w_A}{P_A} - \frac{t_A^iB_A^i}{P_A} \right\} \frac{G_A}{P_A} \]  

(6b)

or alternatively as,

\[ V_B^i = V^i \left( \rho_B, \frac{w_B}{P_B}, t_B^i, B_A^i, \frac{G_B}{P_B} \right) \]  

(7a)

\[ V_A^i = V^i \left( \frac{w_A}{P_A}, t_A^i, B_A^i, \frac{G_A}{P_A} \right) \]  

(7b)

With the assumption that the income tax base is equal to the wage base (\( B_j = w_j \)), we can rewrite equations (7a) and (7b) as

\[ V_B^i = V^i \left( \rho_B, \frac{w_B}{P_B}, t_B^i, G_B \right) \]  

(8a)

\[ V_A^i = V^i \left( \frac{w_A}{P_A}, t_A^i, G_A \right) \]  

(8b)

In the above equations, we can determine that \( V_\rho < 0, V_w > 0, V_i < 0, \) and \( V_G > 0 \). This implies that a person’s utility increases with the wage rate and the level of public goods provided, and it decreases with a higher probability of unemployment or higher tax rates.

A person will decide to migrate from country A to country B only if

\[ V_B^i \left( \rho_B, \frac{w_B}{P_B}, G_B, t_B^i \right) > V_A^i \left( \frac{w_A}{P_A}, G_A, t_A^i \right) \]  

(9)
The individual will migrate to another country only if the utility associated with doing so is higher than staying at home. In addition, if he/she can choose from a set of countries he/she will choose the one that maximizes the gain in utility.

This theoretical model includes fiscal factors in individuals’ utility functions. This results in one of the motivating factors in the migration decision being differences in tax rates and public goods between the origin and destination countries. Thus, an individual’s choice among locational alternatives involves a Tiebout process of adjustment. The criterion for such a process to be optimal is that individuals will locate themselves in such a fashion that each person’s contribution to private and public values is the same in all locations.

This theoretical model yields the following testable predictions:

1. The level of public goods provided by a country should, ceteris paribus, have a positive relationship with the likelihood of individuals choosing this country as a migration destination.

2. The marginal income tax rate in a country should, ceteris paribus, have a negative relationship with the likelihood of individuals choosing this country as a migration destination.

3. The rate of unemployment in a country should, ceteris paribus, have a negative relationship with the likelihood of individuals choosing this country as a migration destination.

2. DATA AND VARIABLES

The three predictions of the theoretical model are tested using European migration data from the time period 1980-1995. Countries are included in the sample upon their entrance into the European Union. Therefore, the number of countries in the study grows over time, it is an unbalanced panel. The data set contains a maximum of 14 countries over a period of 18 years resulting in 1,410 country-to-country pairs. The data contains macroeconomic flows of migrants between 14 EU countries (there is no migration data for Luxemburg). Corresponding microeconomic migration data is not available for European countries over this time period; however, it is feasible to test the model’s predictions with the available macro level data.

4 It should be noted that only the 1,410 country pairs (primary observations) with non-zero migration are used in the data. Due to the structure of a conditional logit it is irrelevant whether or not the non-existent pairs are included in the data.
The data on migration flows are taken from the International Migration Statistics database, available from the Organization for Economic Cooperation and Development (OECD, 1999a). This is the only complete database containing bilateral migration data for EU countries. As discussed in Mayda (2005), this OECD migration data contains some zero observation flows which may not truly be zeros. In this OECD data set, very small flows were recorded as zeros, although they are not absolute zeros. So, some of the zero observations are truly zero while others may simply be a very small number. As Mayda (2005) showed, this does not pose a substantial problem regarding the reliability of this data set or results derived from it. In fact, our results are robust to the exclusion of zero observations.5 The Social Expenditure Statistics and Government Finance Statistics databases provided by the OECD are used for data on public expenditures and tax rates, respectively (OECD, 1999b). Other macroeconomic indicators are taken from World Development Indicators (World Bank, 2005).

The dependent variable is a dichotomous migration choice with weights based on the number of migrants between each pair of countries in a given year. As this variable’s structure is specific to the conditional logit approach, a further discussion of the dependent variable is included in the methodology section. The paper’s hypotheses require testing the impact of public goods, tax rates and unemployment on migration. The independent variable for public goods provided is the per capita social expenditure in a country. The tax rate is the effective tax rate and the unemployment rate is the standard definition. Unemployment levels at home and abroad (Unemplorigin and Unempldestn) are used to construct the difference variable (Unempldiff = Unempldestn - Unemplorigin) which is included in the analysis.

The hypotheses are tested with tax and spending variables as ratios and alternatively as separate variables. Papers such as Buchanan and Goetz (1972), and Ott and Shadbegian (1993) utilize a “fiscal surplus” variable.6 This fiscal surplus variable is defined as the ratio of government per capita social spending divided by per capita taxes. Fiscal surplus variables are constructed for the migration origin and destination and are denoted as Fiscalorigin and Fiscaldestn, respectively. A variable is also constructed for the difference between Fiscalorigin and Fiscaldestn and is denoted as Fiscaldiff. The results shown in the paper use the fiscal surplus approach. However, the results are consistent when the tax and spending variables are used separately (instead of as a ratio), as is suggested by others such as Fox et al. (1989). These additional results are available on request.

There are other independent variables in the analysis such as real GDP per capita (in purchasing power parity dollars) in the origin and destination countries (GDPorigin and GDPdestn) and the standardized differences between them (GDPdiff). This difference variable has a unique value for a specific pair of countries in a particular year. To control

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5 Results available on request.
6 Readers should note that this “fiscal surplus” variable in the literature, and in this paper, is not defined as total tax revenue-total spending.
for the existence of the immigrant population of the same nationality in the destination
country we use the logarithm of the stocks of migrants that have migrated from the same
origin country in the past, denoted as the variable stocks. This stocks variable helps to capture
network effects of previous migrants. Network effects have been cited in numerous
migration studies including Curran and Rivero-Fuentes (2003), Massey (1990) and Stark
(1991). Transportation costs are proxied through the use of a distance variable which is
measured as the distance (in kilometers) between the capitals of the migration origin and
destination countries. The Appendices contain results with some additional demographic
variables. The variable “weight” represents the number of people who chose to migrate
from a specific origin to a specific destination in a particular year. Descriptive statistics
for all of the variables are presented in Table 1 (differences are calculated as the value of
the destination minus the value of the origin).7

Table 1. Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrate</td>
<td>Dependent variable denoting the choice of whether to migrate or not</td>
<td>0.27</td>
<td>0.44</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Unemplorigin</td>
<td>Unemployment Rate in the country of origin</td>
<td>9.92</td>
<td>4.14</td>
<td>1.5</td>
<td>23.9</td>
</tr>
<tr>
<td>Unempldestn</td>
<td>Unemployment Rate in the destination country</td>
<td>7.5</td>
<td>3.61</td>
<td>1.5</td>
<td>18.2</td>
</tr>
<tr>
<td>Unempldiff</td>
<td>The difference in unemployment rates</td>
<td>-2.41</td>
<td>5.28</td>
<td>-20.4</td>
<td>10.4</td>
</tr>
<tr>
<td>GDPorigin</td>
<td>GDP per capita in the country of origin</td>
<td>16334</td>
<td>5909</td>
<td>5056</td>
<td>27717</td>
</tr>
<tr>
<td>GDPdest</td>
<td>GDP per capita in the destination country</td>
<td>21314</td>
<td>4080</td>
<td>13387</td>
<td>28732</td>
</tr>
<tr>
<td>GDPdiff</td>
<td>The difference in GDP per capita</td>
<td>4980</td>
<td>6543</td>
<td>-9980</td>
<td>21532</td>
</tr>
<tr>
<td>Fiscalorigin</td>
<td>Fiscal surplus in the origin country</td>
<td>0.7</td>
<td>0.16</td>
<td>0.42</td>
<td>1.24</td>
</tr>
<tr>
<td>Fiscaldestn</td>
<td>Fiscal surplus in the destination country</td>
<td>0.74</td>
<td>0.16</td>
<td>0.58</td>
<td>1.24</td>
</tr>
<tr>
<td>Fiscaldiff</td>
<td>The difference in fiscal surplus</td>
<td>0.04</td>
<td>0.19</td>
<td>-0.51</td>
<td>0.52</td>
</tr>
<tr>
<td>Distance</td>
<td>Distance in kms between the two capitals</td>
<td>1294</td>
<td>856</td>
<td>165</td>
<td>3738</td>
</tr>
<tr>
<td>Stocks</td>
<td>Stocks of migrants already in the destination country</td>
<td>71138</td>
<td>120444</td>
<td>1600</td>
<td>586100</td>
</tr>
<tr>
<td>Weight</td>
<td>Number of people who migrated from the origin to the destination</td>
<td>3407</td>
<td>8072</td>
<td>0</td>
<td>48000</td>
</tr>
</tbody>
</table>

There is a wide divergence for the tax and social expenditure variables among the countries
in the sample. As an example of this, Figure 2 shows a “fiscal map” for the 15 EU
members (for the year 1995). On the axes of Figure 2 are per capita social expenditure
and average tax rates. The vertical line drawn represents mean per capita social expenditure
for all 15 European Union countries in 1995.

7 Table 1 lists the differences in the actual values of GDP per capita. However, this difference is standardized before
inclusion in the analysis.
As an example of the paper’s hypotheses, let us consider Germany for the year 1995. Figure 3 is identical to Figure 2 except it has been re-centered around Germany. This allows for the figure to be separated into four quadrants based on how each country’s $E_j$ (expenditures) and $T_j$ (tax rate) compares to that of Germany.

From Figure 3 we can state that for the four quadrants

I: $E_j \geq E_{GER}$ and $t_j \geq t_{GER}$ (DEN, LUX)

II: $E_j \geq E_{GER}$ and $t_j \leq t_{GER}$ (SWE)

III: $E_j \leq E_{GER}$ and $t_j \leq t_{GER}$ (FIN, AUS, UK, POR, SP, GRE)

IV: $E_j \leq E_{GER}$ and $t_j \geq t_{GER}$ (FRA, BEL, NET, ITA, IRE)
In Figure 3, a move from any point in quadrant I or III to the position designated by Germany, involves a trade off between social expenditure and taxes. On the other hand, a move from anywhere in quadrant IV to Germany involves no trade-off. For example, this would suggest that a movement from Ireland to Germany is superior to a move from Denmark to Germany. These figures are merely an illustration of the model’s hypotheses, the methodology used for statistically testing these hypotheses is discussed in the next section.

3. EMPIRICAL METHOD

The methodology employed to test the model’s hypotheses is the conditional logit, a form of logistic regression that allows for the weighting of observation “groups”. In this application, groups are considered to be origin-destination country pairs. The ability to weigh country pairs is an advantage of the conditional logit and is one of the reasons it is employed in this analysis. The logit approach is, in general, very common in studies of migration.

An individual will choose to migrate from country A to country B only if he/she receives a higher utility in the destination country as compared to the origin ($V_B > V_A$).

Although the unobservable utilities are unknown, the migration decision ($Y=0,1$) is observed. Specifically, it is observed that $Y=1$ if $V_B > V_A$ and $Y=0$ if $V_B \leq V_A$. The formulation of this random utility model is represented by the equations

\[ V_A = \beta_A \cdot z + \varepsilon_A \]  
\[ V_B = \beta_B \cdot z + \varepsilon_B \]  

(10a)

(10b)

In the conditional logit model, utility depends on a set of variables that includes aspects specific to the individual and to the choices. If we distinguish them as $z_{ij} = (x_{ij}, w_j)$, then $x_{ij}$ will vary across choices (in our case different potential destinations) while $w_j$ contains the characteristics of the individual.

If we denote by $Y=1$ the individual’s choice of moving to country B we have

\[ \Pr[Y = 1 \mid z] = \Pr[V_B > V_A] \]  

(11)

The above relation can be proven to be equal to

\[ \Pr[Y = 1 \mid z] = \Pr[\beta \cdot z + \varepsilon > 0 \mid z] \]  

(12)

where $\beta$ is a vector of coefficients equal to $\beta_B - \beta_A$. 

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The critical values are distributed as a hyperbolic-secant-square ($sech^2$) distribution, the cumulative distribution of which is the logistic function. In small samples, these critical values differ from t-statistics. However, the sample is large enough that their distributions are asymptotically the same.

The conditional logit model, by using the observed revealed choice, captures the unobserved attributes of the choice. It is essentially a fixed effects model and in our case it helps in identifying the country’s unobserved specific factors. By assuming homogeneity within countries, the model solves the problem of serial correlation between locations because it assumes heterogeneity across them. The difference between the commonly used multinomial logit model and the conditional logit model is that the former has the choice probabilities dependent exclusively on individual characteristics. The McFadden model, on the other hand, considers the effects of the choice characteristics (country differences in our case) as well, allowing for the unobserved differences to play a role in determining the probabilities. Moreover, using a probabilistic choice model allows us to move beyond the potential problems that a linear probability estimation might incur, such as lack of efficiency of the estimating method, as well as the potentiality of the conditional expectations lying outside the limits of the $(0,1)$ interval.\textsuperscript{8} Readers interested in more information on the conditional logit are referred to Anderson (1970), McFadden (1974), Chamberlain (1980) and Greene (2002).

In its empirical form the migration decision from countries A to B is shown as

$$Migrate_{AB} = \alpha + \beta_1 Fiscaldiff + \beta_2 Unempldiff + \beta_3 GDPdiff + \beta_4 dist + \beta_5 stocks + \epsilon \quad (13)$$

In accordance with the theoretical model, we expect the sign of the fiscal surplus variable to be positive. Similarly, it is expected that the sign on the unemployment variable should be negative. The sign for the difference in GDP is expected to be positive as countries with higher incomes should be more attractive to migrants. The distance variable should have a negative sign as it is a proxy for transportation costs. The coefficient on the stocks variable is expected to be positive. As discussed previously, the presence of other immigrants from the same origin at a potential destination makes adjustment easier and may represent some network effects.

The ability of the conditional logit to weight observations is important because of the way in which the dependent variable is constructed. The dependent variable is a zero/one variable representing the migration choice. However, the data in this paper is macroeconomic flows, not a microeconomic survey. Therefore, the level of observation is country to country, not individual. Each observation is a country pair in a given year. Each country-pair observation is weighted by the variable $weights$ listed in Table 1.

\textsuperscript{8} Another possible advantage of using the conditional logit approach relates to the nature of the OECD data. Conditional logit estimates the number of migrants conditional on there being a non-zero value. Thus, the choice of being a zero value or not (i.e. significant migration flow in that country pair) is estimated separately. This is particularly useful for data sets such as the OECD with many zero pairs as there may be something systematically different between zero and non-zero country pairs which is captured by the conditional logit but would not be by OLS.
For instance, let us consider the case of Germany in 1993. Let us assume that in 1993, a total of 2700 German residents decided to migrate. Let us further assume that 2000 Germans went to France, 500 to the U.K. and 200 to Greece. Germany will have three country pairs for 1993 (Germany-France, Germany-UK and Germany-Greece). There will be a 0 and a 1 outcome for each of the three country pairs. The outcomes are weighted by the number of individuals making that choice. For instance, there will be a Germany-France observation equal to 1 with a weight of 2000 on that observation. This represents the fact that 2000 individuals chose this Germany-France migration. However, 700 (500+200) individuals did not choose Germany-France migration, they chose to migrate to other countries. Therefore, there will be a Germany-France observation equal to 0 with a weight of 700 to represent the fact that 700 individuals did not choose Germany-France migration.

4. Results

The paper’s results strongly support the model’s predictions that fiscal variables have a significant impact on migration decisions. Results are presented in Tables 2-4. Table 2 shows results for all observations together, while those in Table 3 include a structural break to take account of the 1992 Maastricht treaty. The sample is then tested by region, as is shown in Table 4. In addition to coefficients, standard errors and z-statistics, the odds ratios are also displayed on the tables. The odds ratio is useful in gauging the relative impact of variables on the likelihood of an outcome in logistic regressions.

As anticipated, the fiscal surplus variable is both positive and significant; supporting the hypothesis that people consider fiscal factors in their migration decisions. As expected, the unemployment variable is both negative and significant, suggesting that a higher level of unemployment in a potential destination is a disincentive to potential immigrants. The differences in GDP variable is unexpectedly negative. This suggests that unemployment may be a larger factor in migrants’ expected income. Both the distance and stocks of migrants variables are significant and of the anticipated sign. Distance has a negative sign suggesting that people would choose to move to a country closer to their origin. The migrant stock variable is positive.

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9 For those readers unfamiliar with an odds ratio, a value of .9 would mean a change in the dependent variable made the outcome Y=1, 10% less likely. A value of 1.1 would mean it made Y=1, 10% more likely.
In February 1992, the leaders of the 12 (at the time) EU members signed the Maastricht treaty. This treaty allowed for increased free movement of individuals between all European Union countries by establishing common citizenship.\(^{10}\) Common citizenship allows for individuals to freely work in any member country. This agreement initiated the efforts for the removal of all custom stations and passport checkpoints within the European Union and an increased effort to link up transportation routes.

\(^{10}\) While the Maastricht treaty did represent a significant step in increasing labor mobility across borders, the first agreement on abolishing borders was reached among France, Germany, Belgium, the Netherlands and Luxembourg in 1985 and was reaffirmed in 1990. It came into effect in 1995 with the Schengen Agreement and was ratified by the Treaty of Amsterdam in 1999. Ireland and the United Kingdom are taking part in only some aspects of the agreement.
Maastricht’s establishment of the common citizenship may cause a systematic difference in the pre- and post-treaty samples. In order to take account of this possibility, the analysis is run for the time periods 1984-1991 and 1992-1995 separately. These results are shown in Table 3. The significance of economic factors from 1992-onward is crucial since this time period reflects the current (and future) situation of the Maastricht treaty.

There are some major differences in significance of the variables across the two time periods. The effect of unemployment differences increases dramatically in the post-Maastricht era. A related result is that differences in distance had a stronger impact on migration before the Maastricht treaty. This is as expected since there was an increase in transportation linkages between EU countries and a move towards reducing border controls occurring during this time period. Given these trends, one would expect market forces such as unemployment to have a greater impact on migration decisions in the later time period. Fiscal differences remain an important determinant of the migration destination. The marginal effect of fiscal differences remains relatively unchanged across the two time periods. The variable differences in stocks is significant and of the anticipated signs in both time periods. The differences in GDP variable has mixed results being positive before Maastricht and negative afterwards.

**Table 3. Sample with the Maastricht Treaty as a Structural Break**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Pre-Maastricht</th>
<th>Post-Maastricht</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Z-statistic</td>
<td>Odds Ratio</td>
<td>Z-stat.</td>
</tr>
<tr>
<td>Fiscaldiff</td>
<td>0.045</td>
<td>14.35*</td>
<td>1.046</td>
</tr>
<tr>
<td>Unempldiff</td>
<td>0.002</td>
<td>0.18</td>
<td>1.000</td>
</tr>
<tr>
<td>GDPdiff</td>
<td>0.0006</td>
<td>0.06</td>
<td>1.000</td>
</tr>
<tr>
<td>Distance</td>
<td>-1.779</td>
<td>-17.83*</td>
<td>0.168</td>
</tr>
<tr>
<td>Stocks</td>
<td>0.006</td>
<td>19.10*</td>
<td>1.005</td>
</tr>
<tr>
<td>Observations</td>
<td>791</td>
<td></td>
<td>619</td>
</tr>
<tr>
<td>Chi-Squared</td>
<td>12641</td>
<td></td>
<td>6796</td>
</tr>
</tbody>
</table>

* denotes variable significant at the 1% level.

**Analysis by Region**

It is possible that the impact of fiscal variables on migration may differ based on the region from which the migrants originate. It is possible that fiscal preferences among individuals may vary by region. As a check for this possibility, the sample is separated into three regions, according to the migrants’ origin, with the results presented in Table 4.
The first group is comprised of migrants originating from the Southern European countries of Spain, Portugal, Italy, and Greece. The Western European countries of Ireland, United Kingdom, France, Netherlands, Belgium, Luxemburg, and Germany are the second group of observations and the Northern European countries of Sweden, Finland and Denmark are the third group.

### Table 4. Sample divided by region

<table>
<thead>
<tr>
<th>Variable</th>
<th>Southern Europe Z-stat</th>
<th>Odds Ratio</th>
<th>Western Europe Z-stat</th>
<th>Odds Ratio</th>
<th>Northern Europe Z-stat</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscal diff</td>
<td>19.94*</td>
<td>1.052</td>
<td>8.93*</td>
<td>1.053</td>
<td>0.34</td>
<td>1.041</td>
</tr>
<tr>
<td>Unempl diff</td>
<td>-0.47</td>
<td>0.992</td>
<td>-5.38*</td>
<td>0.922</td>
<td>0.48</td>
<td>1.201</td>
</tr>
<tr>
<td>GDP diff</td>
<td>1.29</td>
<td>1.017</td>
<td>0.59</td>
<td>1.008</td>
<td>0.49</td>
<td>2.601</td>
</tr>
<tr>
<td>Distance</td>
<td>-9.78*</td>
<td>0.315</td>
<td>-14.19*</td>
<td>0.085</td>
<td>0.36</td>
<td>5.723</td>
</tr>
<tr>
<td>Stocks</td>
<td>22.6*</td>
<td>1.006</td>
<td>21.7*</td>
<td>1.036</td>
<td>1.55</td>
<td>1.035</td>
</tr>
<tr>
<td>Observations</td>
<td>757</td>
<td>586</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chi-Squared</td>
<td>18015</td>
<td>1969</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* denotes variable significant at the 1% level.

The results for the Southern and Western European regions reveal an interesting pattern. Migrants from the southern part of the continent that is considered to be the periphery (both economically and geographically speaking) are valuing the differences in the provision and costs of public goods (fiscal variables) relatively more than market conditions (unemployment and GDP differences). During this time period, the differences in unemployment between Southern European countries such as Spain and Greece and the rest of the European Union were very large. These differences were large whether Southern European immigrants were going to Northern or Western Europe. It may be then that the unemployment rate had less impact on the immigrants’ destination decision as small differences in unemployment between destination countries are not significant when the overall difference between migration origin and destination is so high. On the other hand, migrants from the core of the Union experience a more balanced impact between the unemployment rate and fiscal surplus variables.

The distance variable is significant and has a greater negative impact for migrants from Western Europe than it does for migrants from Southern Europe. This may reflect marginal changes in distance having a smaller effect at farther distances. Given that Western European countries are the primary migration destinations in the EU, individuals from Southern European countries usually have to migrate farther distances within Europe than do individuals originating from Western European countries. Therefore, an individual from Southern Europe is faced with a relative far distance to migrate and small changes in distance may have little marginal impact on their decision. However, for an individual from Western Europe who is migrating a relatively short distance, a marginal change in distance may have a far greater impact. While outside the scope of this article, the different impacts of distance on migration by country of origin may be an interesting avenue for future research.
One needs to exercise caution when interpreting results from the very small sub-sample of Northern Europe countries. Given the small number of observations in this group (only 67 country pairs), it is not surprising that variables were insignificant.

In an attempt to summarize the findings from a regional perspective, one might argue that migrants originating from the European periphery are affected more by the level of social spending and tax rates; while for those who migrate from the core, unemployment, fiscal, and distance differences all play important roles.

**CONCLUSION**

This paper proposes that a country’s fiscal policies regarding taxes and spending affect international migration flows. While this hypothesis has been supported in previous studies of domestic migration, this paper is the first to test the Tiebout hypothesis in an international setting. Empirical results from migration flows within the European Union support the hypothesis that fiscal factors have a significant impact on migration decisions.

Since World War II, the world has been moving in the direction of increased economic integration. As more countries join economic unions, the traditional methods of controlling migration will no longer be available to them. This means that the impact of other government polices on migration will become more important for these nations’ governments.

This issue is especially important for Western European countries facing potentially large inflows of immigrants from the new Eastern European members of the EU. An even larger pending migration issue for the EU is the consideration of Turkey for inclusion in the Union. Turkey would be the most populous country in the European Union and concerns about migration have already prompted some EU countries to suggest that Turkey’s potential admittance may include permanent restrictions on the free movement of labor.

This paper’s results may lead to more avenues for future research. For instance, while not feasible with the current EU data, it would be interesting to determine how fiscal policies affect not only the size of migration inflows but also the composition of such migrants. Particularly, the possibility might exist that countries with generous “welfare states” may disproportionately attract migrants with a lower level of education or potential employability. Other appealing avenues to explore are the potential redistribution of tax burden and social spending in the post-migration period and whether increased volumes of migration themselves lead to fiscal harmonization.
REFERENCES


Eurostat, 2004. Current Taxes on Income, Wealth, etc. (as a % of GDP), online at http://epp.eurostat.cec.eu.int/portal/page?_pageid=1553,3322626,1553_3322650&_dad=portal&_schema=PORTAL


World Bank, 2005. World Development Indicators CD-ROM. Washington, DC.
APPENDIX A.

ADDITIONAL DEMOGRAPHIC VARIABLES

The analysis is also run with three additional variables: education differences, age differences and fiscal surplus lagged. The results are in Table 5 below. While data is not yet available on the education and age composition of the migration flows, data is available regarding education and the median ages in the sending (origin) and receiving (destination) countries. While not as useful as data on the migrants themselves, insights can still be gained from this data. The variable educationdiff is created as: 

$$\text{educationdiff} = \frac{\text{average years of schooling in destination country}}{\text{average years of schooling in origin country}}.$$  

The variable agediff is calculated similarly using median age in the countries. In order to be sure that the fiscal surplus results are not a result of contemporaneous correlation, the lagged value of the fiscal surplus variable is used instead of the current period fiscal surplus variable.

The results for education are as expected. The coefficient is significant and positive, which can be interpreted as migrants going from lower education countries to higher education countries. The coefficient on the age variable is positive, as expected, but insignificant. It is expected to be positive as migrants come from younger populations and migrate to countries with, on average, older populations. As expected, the lagged fiscal surplus variable is positive and significant (as were the current period fiscal surplus variable results in the body of the paper).

TABLE 5. DECISION TO MIGRATE WITH ADDITIONAL VARIABLES

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Z-statistic</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscaldiff lagged</td>
<td>0.029</td>
<td>11.04*</td>
<td>1.029</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educationdiff</td>
<td>1.27</td>
<td>16.07*</td>
<td>1.035</td>
</tr>
<tr>
<td></td>
<td>(.079)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agediff</td>
<td>0.039</td>
<td>1.58</td>
<td>1.039</td>
</tr>
<tr>
<td></td>
<td>(.024)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unempldiff</td>
<td>-0.131</td>
<td>-13.76*</td>
<td>0.877</td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDPdiff</td>
<td>-0.084</td>
<td>-10.83*</td>
<td>0.919</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance</td>
<td>-1.62</td>
<td>-17.99*</td>
<td>0.196</td>
</tr>
<tr>
<td></td>
<td>(0.090)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stocks</td>
<td>0.006</td>
<td>24.13*</td>
<td>1.005</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1,410</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(country pairs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chi-Squared</td>
<td>18086.65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * denotes variable significant at the 1% level.
APPENDIX B.

ADDITIONAL RESULTS WITH BIRTHRATE DIFFERENCES

A growing number of studies have found that population growth rates can have a significant impact on migration (Hatton and Williamson, 1998; Hatton and Williamson, 2002; Clark, Hatton, and Williamson, 2002). Countries with a large youth population can have a demographic pressure resulting which leads to increased migration outflows. On the other hand, countries with small youth populations can be experiencing the opposite pressure (shortage) and as a result have an increase in immigrant inflows.

In order to test this empirically, we have used birthrates lagged twenty years, as discussed in Hatton and Williamson (1998, 2002). These lagged birthrates reflect the young native population at the time of migration. This variable is constructed as the difference between the destination and origin countries, such that if the variable is negative then the destination country has a lower birth rate than the origin country. The birthrate difference variable is negative and significant, as expected. This lagged birthrate variable is chosen instead of the youth population (aged 15-29) at the time of migration as this current population would include immigrants and therefore suffer causality problems. Using lagged birthrates avoids this problem.

Table 6. Decison to Migrate with Lagged Birthrates

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Z-statistic</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscaldiff</td>
<td>3.430</td>
<td>16.20*</td>
<td>3.088</td>
</tr>
<tr>
<td>(0.211)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth Difference</td>
<td>-0.037</td>
<td>-2.54*</td>
<td>0.964</td>
</tr>
<tr>
<td>(lagged)</td>
<td>(0.015)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unempldiff</td>
<td>-0.114</td>
<td>-13.56*</td>
<td>0.891</td>
</tr>
<tr>
<td>(0.008)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDPdiff</td>
<td>-0.006</td>
<td>-13.86*</td>
<td>0.994</td>
</tr>
<tr>
<td>(0.0004)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance</td>
<td>-2.053</td>
<td>-24.50*</td>
<td>0.128</td>
</tr>
<tr>
<td>(0.084)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stocks</td>
<td>0.006</td>
<td>23.65*</td>
<td>1.006</td>
</tr>
<tr>
<td>(0.0002)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>1,410</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(country pairs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chi-Squared</td>
<td>19286</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * denotes variable significant at the 1% level.