Macrodeterminants of Labor Migration from CEE Accession Countries to Select EU Countries

Denise Joanne François-Seeney

University of Southern Mississippi

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MACRODETERMINANTS OF LABOR MIGRATION FROM 
CEE ACCESSION COUNTRIES TO SELECT EU COUNTRIES

by

Denise Joanne François-Seeney

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

December 2013
ABSTRACT

MACRODETERMINANTS OF LABOR MIGRATION FROM CEE ACCESSION COUNTRIES TO SELECT EU COUNTRIES

by Denise Joanne François-Seeley

December 2013

This dissertation provides a comprehensive and evidentiary theoretical framework on the economic forces behind labor migration among Central and Eastern European (CEE) economies and the impact of said labor migration on European Union (EU) economies. Specifically, this dissertation limits the scope of its discussion as to the nature of macroeconomic effects of CEE migration to the selected destination countries: of the United Kingdom, Ireland, France, Germany, Denmark, and Sweden. Labor flows between the EU and the CEE region seem to be a response to poorly functioning labor markets, insufficient productive capital, a relatively low quality of life, and an increasing demand for low-skilled labor in the EU economies. The empirical analysis is based on the A8 and A2 (collectively the A10) countries, which are used to assess the interconnection between economic decline and economic migration in the post-Soviet era. Accession to the EU has created interest in the causes and consequences of migration to and between A10 countries and Western Europe. By understanding the economic rationale and the determinants’ interaction concerning migration, conclusions may be drawn about labor mobility and its impact on destination countries. Direct empirical estimation of various migration models is considered to determine not only the model’s fit, but also which of several variables (migration stock, wages, short-term unemployment, long-term unemployment, gross domestic product (GDP) per capita, and policies governing
migration) may be interpreted as elasticities of migration’s response to the explanatory variables of interest. The results of this study suggest that migration from CEE countries to EU countries increases GDP per capita, lowers wages and increases unemployment.
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2013
MACRODETERMINANTS OF LABOR MIGRATION FROM CEE ACCESSION COUNTRIES TO SELECT EU COUNTRIES

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Denise Joanne François-Seeney

A Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

Approved:

Shahdad Naghshpour
Director

Joseph J. St. Marie

Edward Sayre

Marianne Marchand

Susan A. Siltanen
Dean of the Graduate School
DEDICATION

To my son, Donovan Maxwell Melaku Seeney, to whom I dedicate this work.

You and this doctoral program are my “fraternal twins” You developed and blossomed even when the words and the writing did not. You have a joy and passion for learning. You teach me every day; you love me unconditionally.
ACKNOWLEDGMENTS

The writer would like to thank her dissertation chair, Dr. Shahdad Naghshpour for his invaluable comments, criticisms, support and overwhelming faith, which has positively and profoundly impacted this academic journey. “Just because it’s difficult, doesn’t mean it can’t be done” is indelibly a part of my personal, academic, and professional DNA. To my committee members, Dr. Joseph J. St. Marie, who reminded me to take time for laughter, and to Dr. Edward Sayre and Dr. Marianne Marchand for their critical and supportive feedback, which helped to give form, function, and substance in my development as a researcher and scholar.

Gratitude is expressed to Dr. Peter Nijkamp for his commentary and encouragement on an early draft presented at the 2011 SRSA conference. His critique and encouragement was instrumental in advancing this project.

Thank you to my colleagues, too numerous to mention, who were my unwavering supporters in this journey. To Dr. Vasiliki (Kiki) Anastasakos, for her friendship and my inspiration for starting this doctoral work.

To Dr. Christopher Bradley, for his patience and ability to give calm in the midst of the storm.

To my family, who in some small way are embodied in this work, as we were once “strangers in a strange land.” To my parents who taught me to appreciate the value and transformative power of education, but most importantly for the joy that comes with learning. To my husband, Trevor, thank you for your patience, even when you didn’t have any more to give.
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
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<tbody>
<tr>
<td>CEE</td>
<td>Central and Eastern European</td>
</tr>
<tr>
<td>CEPII</td>
<td>Centre d'Etudes Prospectives et d’Informations Internationales</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>ILO</td>
<td>International Labour Organization</td>
</tr>
<tr>
<td>IOM</td>
<td>International Organization for Migration</td>
</tr>
<tr>
<td>MIPEX</td>
<td>Migration Integration Policy Index III</td>
</tr>
<tr>
<td>NMS</td>
<td>New Member States</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OLS</td>
<td>Ordinary Least Squares Regression</td>
</tr>
<tr>
<td>PPP</td>
<td>Purchasing-Power Parity</td>
</tr>
<tr>
<td>SOPEMi</td>
<td>Continuous Reporting System on Migration</td>
</tr>
<tr>
<td>UNECE</td>
<td>United Nations Economic Commission for Europe</td>
</tr>
<tr>
<td>UNPD</td>
<td>United Nations Population Division</td>
</tr>
<tr>
<td>VIF</td>
<td>Variance Inflation Factor</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

International migration may not be a new phenomenon, but its form and composition have changed. Massey et al. (1998, 108–9) broadly classifies the modern history of international migration into four stages (1) the age of mercantilism (1500–1800): European domination/colonization; (2) the age of industrialization (1800–1915): migration from Europe to the New World; (3) the interwar period (1915–1950): limited migration; and (4) the age of globalization (1950–present). Hendricks (1997, ii) likens migration to “a natural experiment, placing a worker into a different economic environment while holding his human capital endowment fixed.” Furthermore, Bauer, Haisken-DeNew, and Schmidt (2004, 6) characterize migration as “the movement of people, from one geographic location to another across administrative and political borders.” It is the extent to which individuals are willing or able to move between trades, occupations, and geographic areas. This definition agrees with Lee (1966, 184), who states that migration is the “intent to settle either permanently or temporarily in a place other than a place of origin, generating substantial welfare gains for migrants and their families.” However, by this definition restrictions are not placed on either distance or on the voluntary and involuntary migration forms.

The United Nations World Migration Report (2006) records that the number of migrants worldwide more than doubled in the thirty-five years leading to 2005, with migration flows predominantly from developing to developed countries. As of 2005, international migrants comprised 3 percent of the world’s population with 75 percent of international migrants concentrated in 12 percent of the world’s nations. The
International Organization for Migration (IOM 2003) estimated the total number of international migrants in 2000 to be approximately 175 million. Between 1975 and 2000, the proportion of international migrants nearly doubled from 4½ percent in 1975 to 8 percent in 2005, with the fastest growth between 1985 and 1995 (Organisation for Economic Co-operation and Development [OECD] 2008, 2010). An estimated one-fifth of this increase resulted from the transformation of internal migrants into international migrants when the USSR disintegrated in 1991, the former Yugoslavia divided in 1992, and the former Czechoslovakia divided in 1993. In Western Europe, for example, the migrant population grew from 18.7 million to 32.8 million in the three decades leading to 2000.

For Kaczmarczyk and Okólski (2008, 1), migration has become one of the most “conspicuous population movements in contemporary Europe.” Uneven population and economic growth rates, disparities in job opportunities among countries, labor-market factors, and civil wars all contribute to maintaining the migration phenomenon. Analyzing migration trends, Salt (2002) and Wanner (2002) conclude that Europe is an important destination region, with an estimated fifty-six million migrant stock, followed by Asia with a migrant stock of fifty million, and North America with an estimated forty-one million migrants. Migration, specifically in Europe, came about, according to Zimmermann (1996), in terms of the push–pull factors and characteristics of the destination country, as well as the migration sources. Zimmermann (1996) segments Europe’s history into four migration periods: (1) 1945–1960s (war adjustment and decolonization); (2) 1955–1973 (labor force immigration); (3) 1974–1988 (restrained
migration), and (4) 1988–present (ending of socialism in the East and migration to the West).

Migration does not have to occur directly from origin country to destination country; it may include an intermediary or transit country. Proximity to a high-income country matters such that migration flows, once underway, are strengthened and supported by networks in the destination country. However, evidence exists in the literature that highly skilled and educated immigrants create in the origin country a *brain drain* of the human capital needed for economic development, which has been discussed in Bhagwati and Hamada (1974) and confirmed by Benhabib and Jovanovic (2007) and Docquier and Marfouk (2007).

Zelinsky (1971) and later Skeldon (1997) characterize migration as the interaction of (1) labor-market, economic, political, and demographic factors—referred to as the *push* and *pull* variables—as discussed, for example, in E. Lee (1966); (2) the intermediary structures bridging origin and destination countries through immigrant populations and their sociocultural and ethnic networks, as discussed in Gurak and Caces (1992); (3) administrative policies that either encourage or prevent migration; and (4) geographical and cultural distances.

Labor migration, or cross-border movement for the purpose of employment in a foreign country, is an important incentive for migration from the Central and Eastern European (CEE) countries to Western Europe. Labor migration and its disaggregated skill levels are likely to gain in importance due to low fertility rates and aging populations in Europe that are changing the ratio of the working population to the retired population (Brücker and Trübswetter 2007; Hönekopp and Mattila 2008). Beine, Docquier, and
Özden (2011) suggest the migrant differences may be explained by migrant skill, education, and socioeconomic levels affecting the ability to take on risks, migration costs—both pecuniary and nonpecuniary—and the immigration policies of the destination countries. Lewer and Van den Berg (2008) complement Beine et al. (2011), concluding that migration is not only driven by the push–pull factors, but may be impeded by moving costs.

Statement of Purpose

Migration immediately after the collapse of communism can be characterized as geographical (intraregional movement), reflecting population shifts from the former Soviet republics (i.e., ethnic repatriation, creation of new states and borders, and political conflicts within the CEE region.). Yet, migration poses two broad and distinct questions … the first … concerns the direction and magnitude of the response of migrants to labor earnings differentials over space. The second question pertains to the connection between migration and those earnings; that is, how effective is migration in equalizing inter-regional earnings of comparable labor. (Sjaastad 1962, 81–82)

First, the purpose of this dissertation is to analyze the macroeconomic determinants for and consequences of labor migration from selected CEE countries to the destination countries of the United Kingdom, Ireland, Germany, Denmark, France, and Sweden, each having its own set of migration policies. During the period under study, 1989–2010, these destination countries were, according to Okólski (2007), receiving substantial numbers of foreign workers into their labor pools. Therefore, it is important to understand the macroeconomic effects of migration on gross domestic product (GDP)
growth, wages, and unemployment, allowing for comparative analysis of the relative importance of each variable.

Second, the empirical analysis is based on the A8 and A2 countries, collectively the A10 countries, which can be viewed as a natural experiment characterized by Lemos and Portes (2008, 9) as “arguably correspond[ing] more closely to an exogenous supply shock than most migration shocks studied in the literature.” This dissertation uses the World Bank geopolitical grouping for the CEE countries that will be defined as the A10 countries, otherwise referred to as countries in transition, a descriptor referring to their transformation from centrally planned economies to market economies: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia.

Labor-market–dynamic variations across the CEE countries due to different policy options in each country may explain the different labor-market adjustments. Even with similar growth rates and development levels, some countries evidenced divergent migration characteristics, mirroring similarities both with the developed European Union (EU) and with emerging markets. The 1997 Amsterdam Summit, which resulted in the enlargement of the EU, enabled some of these new member states (NMS) to integrate into a liberal market economy by adopting the EU’s standard economic policies. The weakening of vertical governmental institutions and public-sector retrenchments created an even greater divide between the NMS and their fellow CEE countries.

Indeed, there were variations in the types of labor-market reforms adopted and their labor-market outcomes. The countries that undertook a more radical and liberal reform trajectory along with the platform of postcommunist state building and
development allowed for EU accession in 2004 for the A8 countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia) and in 2007 for the A2 countries (Bulgaria and Romania). However, it is important to mention that even with CEE regional disparities, migration in these transition economies declined with internal reforms. Discussions on the postaccession emigration from the new EU members can be found, for example, in Bauer and Zimmermann (1999), Borjas (2003), Mitchell and Pain (2003), Zoubanov (2004), Péridy (2006), and Aydemir and Borjas (2007).

Third, the prevailing theoretical migration conceptualizations are based on a neoclassical framework that considers the importance of economic incentives in migration decisions. In the absence of any political barriers, immigrants from low-wage countries should migrate to high-wage countries, from high-unemployment to low-unemployment countries. A presumptive stance is taken that the predominant motive for migration is improved income. See, for example, Treyz et al. (1993) discussing expected income and the probability of receiving that wage: The migration decision depends on differential economic opportunities. Individuals weigh the costs and benefits for migrating; with a positive decision to migrate, the expected benefits must, at minimum, be greater than the expected migration costs. The larger the expected income differential between the regions, or the less expensive it is to move, the greater the number of migrants, ceteris paribus. Zimmermann (1994) posits that as long as the marginal productivity of labor differs in various countries, the migration of labor is welfare improving.
This dissertation supports and adopts the notion that migration is economically driven. Low job creation and long-term unemployment are associated with inflexible labor markets. Changes observed during the transition, in terms of unemployment, employment, labor-force participation, and wages may not have occurred without the macroeconomic and structural reforms in the NMS. Increased migration costs could result in shorter distances and shorter stays abroad. This would suggest that a tighter labor market, with higher earning potential and more employment opportunities within the origin country, engenders less emigration. Although positively correlated, tighter labor markets may neither lead to economic growth nor negate other key explanatory factors. Beyond income differentials influencing the decision to migrate, what may be discerned from labor migration and the distributional impact to and responsiveness of labor markets, macroeconomic and fiscal implications (GDP growth), substitution or complement to the destinations’ labor markets, and migration costs? Yet, Decressin and Fatas (1995) point out that the high costs associated with employment search and moving may discourage emigration.

Statement of the Problem

The existence of a transitional period, the restriction to free movement in the CEE, allowed for regulated labor markets, redirecting those living in the CEE to countries with open labor markets (Boeri and Brücker 2001; European Commission 2002). Labor flows between the EU and the CEE regions seem to be a response to poorly functioning labor markets, insufficient productive capital, downsizing of the public sector and social services, the low quality of life in the CEE countries, and an increasing demand for low-skilled labor in the EU economies. The onset of the transition to the postcommunist state
is, at minimum, a complex configuration of integration into international political and economic arenas required by the shift to a market economy. Until the late 1980s, CEE economies were tethered to a unipolar Soviet world by institutional barriers to free movement. Democratization of the CEE political systems was combined with changes in economic structure, unemployment, and labor shortages, each with the risk of creating even more political instability. Reforms and the liberalization of migration policies in CEE countries led to an increased and changed migration pattern. However, during the mid-1990s, policies were adjusted, with many Western European nations taking on the mantle of migration management, a strategy to curb migration influx with the purposeful importation of requisite skilled labor.

*A posteriori*, these restrictive policies did not stave off labor migration from the new EU members. The dismantling of the Soviet Union and the opening of national borders at the start of the 1990s was met with neither the mass exodus nor the permanent emigration negatively affecting wages and native workers’ employment touted in the pre-enlargement literature. See, for example, the discussion of the topic by Straubhaar (1993), European Commission (2008), and Kancs and Kielyte (2010). Kaczmarczyk and Okólski (2008), and Kahanec and Zimmermann (2010) suggest that, while the EU enlargement had a significant impact on migration flows, policy restrictions did not stop migration; rather, they changed the composition of migrants.

The World Bank (2005, 8) offers, “recoveries [from transition recession] … will take years and in some cases decades for most former Soviet Bloc countries to regain their per capita income levels prevailing at the beginning of the transition.” These changes were unparalleled in speed and scope, with the accompanying need to bolster
skill sets and the ability of labor participants to successfully move from a planned to a market economy. Thus, it is important to understand the interrelationship between the EU labor markets and CEE emigration.

The early 1990s saw a GDP decline in the CEE region, but, by the mid-1990s, economic growth in the region was not accompanied by increasing employment and declining unemployment rates. Additionally, increased unemployment rates in CEE countries (except for the Czech Republic) and the need for new employment in EU countries in the agricultural and industrial sectors contributed to labor migration, specifically from Poland, Latvia, Lithuania, and Slovakia to Western Europe. In the latter part of the 1990s, medium-term growth rates did not show any significant increases, which would not support any significant net job creation (Economist Intelligence Unit 2002). Even in the early 2000s, there was an increase in unemployment in CEE countries (Docquier and Marfouk 2007).

Table 1

<table>
<thead>
<tr>
<th>Real GDP Growth (Annual Percent) 1989–2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A8</strong></td>
</tr>
<tr>
<td>Czech Republic</td>
</tr>
<tr>
<td>Estonia</td>
</tr>
<tr>
<td>Hungary</td>
</tr>
<tr>
<td>Poland</td>
</tr>
<tr>
<td>Slovak Republic</td>
</tr>
<tr>
<td>Slovenia</td>
</tr>
<tr>
<td>Latvia</td>
</tr>
<tr>
<td>Lithuania</td>
</tr>
</tbody>
</table>

**A2**

| Bulgaria | −3.3 | −9.1 | −8.4 | −7.3 | −1.5 | 1.8 | 2.9 | −8.6 | −4.8 | 4.7 | 5.1 | 6.4 | 4.9 | 5.6 | 6.4 | 7.3 | 6.9 | 6.8 | 7.0 | 6.8 | −5.0 | 1.1 |
| Romania   | −5.8 | −5.6 | 12.9 | −8.8 | 1.5 | 4.0 | 7.2 | 4.0 | −6.1 | −4.8 | −1.1 | 3.3 | 6.7 | 5.1 | 5.2 | 8.4 | 4.2 | 7.9 | 6.0 | 7.6 | 6.3 | −1.4 |

Slow-growing employment in the A8 and A2 countries was the result of increased labor productivity and structural changes from 1991 to 1993. The imposed liberalization
reforms, while incongruous with the state-run market conditions, and the burgeoning private sector played an important role in reshaping the CEE labor markets during the transition period.

Table 2

Unemployment Rate 1989–2010

<table>
<thead>
<tr>
<th>Year</th>
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<th>Romania</th>
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<tbody>
<tr>
<td>1989</td>
<td>0.3</td>
<td>3.4</td>
</tr>
<tr>
<td>1990</td>
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<td>3.4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
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</table>

Table 3

Long-Term Unemployment Rate 1992–2011

<table>
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<th>Year</th>
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<th>Romania</th>
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<td>31.2</td>
<td>31.2</td>
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Table 4

Employment Growth Rate 1991–2010

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Structural reform policies were introduced to liberalize trade, decontrol domestic prices, and eliminate and privatize state-run entities. These reforms were critical in reshaping the new CEE economies, impacting the labor markets and encouraging reallocation and restructuring of the state-run sector. The state-run sector declined, shedding labor with the growing private sector, but labor did not transfer to the private sector due to a low absorption capacity caused by skill mismatches. Countries such as the Czech Republic, Hungary, Poland, and Slovenia, were more advanced in their higher living standards and economic development, counterbalancing the loss of state-sector jobs with increased jobs in the private sector (see Blanchard, Commander, and Coricelli 1994). However, imbalances in the pace of development remained. By contrast, Romania maintained employment at the risk of hyperinflation with limited structural changes. Of the A8 countries, Poland had the greatest emigration, Hungary one of the lowest due to their high wages and social-welfare benefits. Latvia, the poorest of the A8 countries, also saw large emigration even in the face of rising economic growth and increasing wages.
The reallocation of resources from low-productivity sectors to high-productivity sectors, decentralization, deregulation, and market-oriented institutions had a severe impact on employment levels in the CEE countries. Privatization was instrumental in shaping the labor-market dynamics. Privatization and the so-called shock therapy—a combination of measures including liberalized prices, cuts in state subsidies, and budget stabilization—were viewed as catalysts, especially if these economies were to converge with that of Western Europe. Furthermore, Korcelli (2000) suggests that CEE countries’ emigration flows resulted from political instability pushing the CEE migrants out to Western Europe. Where there once was an equal distribution of economic activity, as measured by employment rates and wages, there were now regional disparities affecting labor-market efficiencies.

Furthermore, migration measurement is necessary as it estimates the size, composition, and growth of a population, and provides information to manage migration flows. Given the change in regulations governing labor mobility, reintegration into Europe and postaccession migration represent an exogenous shock to labor supply, thus making it an ideal case for economic analysis. Garson, Redor, and Lemaître (1997) suggest that the movement from a state-controlled economy to a market economy leads to an excess of labor, which should in turn lead to high unemployment in the destination country. This observation gives a necessary structure to evaluating the economic impacts on the destination economies. Increased labor productivity, wages, and private consumption all suggest a need for faster growth to increase employment levels. In the absence of these factors, it is easy to understand why emigration pressures existed within the CEE region, thereby widening economic gaps.
Contribution

Salt, Clarke, and Wanner (2004, 86) suggest, “much of migration modeling and literature assessing the relationship between population and development focuses on the migration impact on the origin countries rather than on economic growth in destination countries.” First, the A10 countries are used to assess the interconnection between economic decline and economic migration in the post-Soviet era. This dissertation contributes to and is positioned in the current literature on the determinants of international migration and its economic effects on employment, wages, and growth in per capita gross domestic product for the destination country. This dissertation provides a comprehensive and evidentiary theoretical framework on the economic forces behind labor migration of CEE economies and the impact of CEE emigration to EU economies from 1989 to 2010. These findings do not control for selection or estimated counterfactual incomes that potential migrants could earn at either the destination or origin countries. Similar treatment of this topic can be found in X. Clark, Hatton, and Williamson (2007); Belot and Hatton (2008); Ortega and Peri (2009); Mayda (2010) and Grogger and Hanson (2011).

Second, while there is diversity in their economic development, the CEE countries may be characterized as homogeneous with respect to international migration. Their labor-market performances are characterized by Lemos and Portes (2008) and Lehmann and Muravyev (2009, 6–7) as having “shortages of labor, unemployment, high levels of unionization, and no unemployment protection …. [and] can therefore be regarded as a kind of natural experiment that may be useful in testing economic theories.” However, causality may be difficult to determine in migration as it is within reason to
hypothesize a relationship due to reverse causation. The interchange is two way; the effects of development on migration and migration upon development are intertwined. As such, this dissertation will only look at the impact emigration from CEE countries has on EU countries.

Third, accession to the EU has created interest in the causes and consequences of migration to and between CEE and Western Europe. The restrictive immigration stance in many Western European nations was met by a perfect storm—the ending of exit controls in Eastern Europe, transformation from centrally planned economies to market-oriented economies, creation of new institutions, EU political stability, an ageing population in Western Europe with an increasing dependency ratio, and shortages of both the unskilled and skilled labor, converged to form a complex migration picture.

The existing literature tends to focus on economic and demographic variables, ignoring the role of national migration policies and their effects on migration flows. However, as Czaika and De Haas (2011a, 23) put forth, the “operationalization of migration policy is not standardized with differing methodological approaches for testing migration policies.” Rather, they conclude there are research gaps and a formidable opportunity in bridging the gap between the imaginative and theoretically rich qualitative migration policy literature … by better embedding the empirical analysis of policy effects into a comprehensive theoretical framework of the economic and noneconomic forces driving international migration in sending and receiving countries.

Fourth, by understanding the economic rationale and the determinants’ interaction, conclusions may be drawn about labor mobility and its impact on destination countries’
per capita gross domestic product, average gross wages, and unemployment. Within the neoclassical framework, the economic model presents migration flows as a result of wage differences between origin (low-wage) and destination (high-wage) countries. The theoretical assumptions are that low-wage countries will have less capital and more labor. Conversely, high-wage countries will have more capital and less labor. High labor migration will decrease origin country supply and increase wages; high-wage countries will decrease wages as a function of immigration, eventually causing international equilibrium. Such differentials foster movement from low-wage regions to high-wage regions (Bauer and Zimmermann 1999; Dustmann et al. 2003; Hatton and Williamson 2003, 2005a, 2005b). Massey (1988, 1990, 2003) also points to historical evidence illustrating the same key fact: Low levels of income and development tend to foster emigration.

However, the neoclassical migration model not only tends to simplify migrant behavior, it is also limited empirically (Massey et al. 1998) and conceptually (Arango 2000). The neoclassical framework does not allow for heterogeneity among migrants. The economic factors neither adequately explains diversity in migration nor do they explain why individuals migrate at varying rates. For the purposes of this dissertation, as such, human-capital theory, which includes sociodemographic variables as important migration determinants, is merged with neoclassical theory.

Finally, looking solely at unemployment rates to the exclusion of other indicators ignores a sector of the population, that of the discouraged worker who is the victim of long-term unemployment. An increase in the origin unemployment numbers may reduce labor participation, as individuals may become discouraged from entering the labor
market. This is referred to as the discouraged-worker effect. Unemployment rates, which are based on labor-force calculations, do not consider long-term unemployed discouraged workers as unemployed, yet the long-term unemployed may add to migration flows. Discouraged workers are individuals who have left the labor force because they were unsuccessful in job searches hence, their definition as long-term unemployed individuals (Woytinsky 1940; Humphrey 1940; Isserman, Taylor, Gerlin and Uwe; 1986). This subset of the unemployment rate receives little attention, in part because there is little data to support an individual analysis.

Determinants of Migration

Miron (1978) emphasizes the need to understand the behavior of migrants as both information gatherers and decision makers. Migration is the outcome of decisions by migrants within the context of both institutional and labor-market constraints. Goedings (1999) defines these behaviors as root causes, which are important for the emergence and continuation of migration. Thus, migration, and by extension labor migration, is an investment opportunity for which migrants evaluate the benefits and detriments of employment and income when compared to their current situation in the origin country (Fischer and Straubhaar 1996).

Individuals who migrate from less-developed origin countries to more-developed destination countries to realize greater economic gains increase the migration rates in the short and medium terms. Individuals will compare wage benefits from migration with moving costs. If benefits outweigh costs, migration occurs. The benefit is calculated as expected income differentials between the origin and destination country with employment, as opposed to unemployment, assumed (see Borjas 2003; Card 2005;
Dustmann and Glitz (2005). Hanson (2008) finds there are large gross gains to international migration, but net gains are more difficult to assess. Zimmermann (1994) suggests that the macroeconomic effects of migration must depend on the acceptance of the migrant worker’s cost–benefit analysis as the decision to migrate to the destination country, specifically with respect to an analysis of the responsiveness of the labor market and wage flexibility. Labor characterization can be either substitutional or complementary. Lopez (2003) and Orrenius and Zavodny (2003), for example, suggest that incoming low-skilled migrants may not be competitors but complements to native workers. If economic opportunities do not exist in other regions, individuals’ desire to migrate is lessened. With a dearth of data on migration costs, net gains of migration from the perspective of the migrants may be difficult to assess.

While Lewis (1958) holds that economic growth is a complement to migration, economic growth and income levels alone are not sufficient to explain migration trends. Lucas (2004) emphasizes the importance of distinguishing between long and short migration and their impacts on growth, development, and poverty. It is important to look at the structure of the labor markets and the supply and demand in various occupation sectors. Glantz (1975) offers that in the absence of government intervention, an efficient labor market can be expected to move workers between industries, occupations, and regions with migration as a labor-market adjustment factor. Czaika and De Haas (2011b) provide evidence that migration can be effective in diversifying income risks, such that it occurs even in the absence of economic disparities. Yet, Hanson (2010) cautions that failure to control for other migration opportunities could produce biased estimates.
The lack of economic development in developing nations may exacerbate any migration pressures, settling at the lower income levels in what Martin (1993) and Martin and Taylor (1996) refer to as the migration hump, whereby over time and with increasing income, countries will move from net sending to net receiving (Figure 1).

![Figure 1. The migration hump. A – Little migration at low levels of development due to limited incomes; B – As development increases, income levels increase, increasing emigration; C – Income threshold is reached, migration levels off and declines as origin economy offers opportunities; D – Migration pattern with economic restructuring. Source: Adapted from Martin, P. 2004. “Migration and Development: Toward Sustainable Solutions.” Discussion Paper DP153/2004. Geneva: International Institute for Labour Studies.](image)

Martin and Taylor (1996, 47) suggest that the “hump is most likely to be noticeable when three conditions are met: when there are continued opportunities abroad that pull migrants out of the country, when supply-push emigration pressures rise as the economy adjusts, and when networks of family contacts with migrants bridge the border.” Yet, Martin (1993) suggests the migration hump leads to a contradiction, such that the very same economic policies intended to reduce migration in the long run can increase it in the short run. Thus, any observations arising from the literature on migration are dependent on the model’s causality assumptions. For more detailed
discussions of the existence of the migration hump, see, for example, Easterlin (1961); Zelinsky (1971); Akerman (1976); Faini and Venturini (1994, 2008); Hatton and Williamson (1994); De Haan (1999); Vogler and Rotte (2000); Lucas (2004, 2005); Dumont, Martin, and Spielvogel (2007); and X. Clark, Hatton, and Williamson (2007).

Pedersen, Pytlíková, and Smith (2004); Aroca Gonzalez, and Maloney (2005); and Mayda (2006) suggest that labor-market indicators are important migration determinants. Greenwood (1985) suggests that migration is an important determinant of population change, altering the characteristics in both the origin and destination countries. Depending on the character of the changes in labor supply, migration may affect wages and employment of both native and immigrant populations in destination and origin countries. As the origin country offers more opportunities, migration reaches its saturation point and begins to decrease. De Haas (2007) suggests there exists a nonlinear relationship, an inverted U, between development and migration. However, labor migration will continue not only due to differentials between origin and destination countries, but also the network effect, or the existence of similar origin migrant groupings in the destination country. Chiswick (1978), for example, suggests migrants plan their move and invest in information necessary for integration into the destination’s society and labor market.

Migrant Characteristics

Borjas (1987), Chiswick (2000), and Chiquiar and Hanson (2005) purport that migrants are different from nonmigrants in personal characteristics, skills, and labor-market performance. Indeed, Glover et al. (2001) suggest that migrants may be more entrepreneurial than their fellow nationals or even the destination nationals. Since they
have opted to leave their home for better opportunities, this may be an indicator of the
entrepreneurial spirit. As a result, there may be positive impacts on the destination
country, both in increasing economic development and increasing employment levels.
Niebuhr (2010) speaks to the positive impact of cultural skills and professional networks
leading to economic ties between the destination and origin countries. However, it should
be noted that many of the characteristics influencing the migration decisions might be
unobservable, making causality difficult to establish. Linkages between international
migration and potential migrants are consistent with general patterns of empirical
findings and with the following stylized facts.

The composition of the migrant population is a key issue in evaluating the
consequences of migration, for which there is a developed body of literature. Greenwood
(1985), Long (1988), Cadwallader (1992), and Maynard et al. (1997) discuss life-cycle
factors, demographics, and physical well-being affecting the decision to migrate. Shaw
(1975) gives a composite of a potential migrant: male and between the ages of twenty
years and forty-five years. Older individuals tend to have higher levels of industry-
specific human capital. Therefore, age, job tenure, annual benefits, and compensation are
positively correlated. There may be a high level of educational attainment (professional
and managerial job status) and often above-average socioeconomic status in the origin
country, but below average socioeconomic status in the destination country. Renters are
more likely to migrate than homeowners, as they incur lower moving costs. Oswald
(1999), Böheim and Taylor (2002), and Zaiceva and Zimmermann (2008) conclude that
people with children are less likely to migrate.
younger than twenty productive employment age thirds of the CEE migrants were male; they were predominantly young and of the

Hintermann Wallace (200

In the destination countries, these migrants were relegated to work as low-skilled and middle-aged persons with vocational or technology education and prior work experience.

In the destination countries, these migrants were relegated to work as low-skilled and seasonal workers in the agriculture, construction, and domestic trades, according to Wallace (2002) and Morawسكa (2002). Fassmann’s (1997) and Fassmann and Hintermann’s (1997) profiles of the labor migrants from Hungary, Poland, and the Czech and Slovak Republics are indicative of the CEE migrant in general: An estimated two-thirds of the CEE migrants were male; they were predominantly young and of the productive employment age—75 percent younger than forty years and 40 percent younger than twenty-four years. They were employed in the industrial, construction, and

Table 5

Net Migration per 1,000 Population

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<td>7.1</td>
<td>9.2</td>
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</table>

Note: Definition of net migration rate: This entry includes the figure for the difference between the number of persons entering and leaving a country during the year per 1,000 persons (based on midyear population). An excess of persons entering the country is referred to as net immigration (e.g., 3.56 migrants/1,000 population), an excess of persons leaving the country as net emigration (e.g., −9.26 migrants/1,000 population). The net migration rate indicates the contribution of migration to the overall level of population change. High levels of migration can cause problems such as increasing unemployment and potential ethnic strife (if people are coming in) or a reduction in the labor force, perhaps in certain key sectors (if people are leaving).

Sources: OECD Factbook 2005; OECD Factbook 2010; OECD Factbook 2012.

Pre-enlargement CEE migration was towards traditional destination countries of Russia, Germany, Austria, and Finland, with immigrants characterized as married and middle-aged persons with vocational or technology education and prior work experience.

In the destination countries, these migrants were relegated to work as low-skilled and seasonal workers in the agriculture, construction, and domestic trades, according to Wallace (2002) and Morawskа (2002). Fassmann’s (1997) and Fassmann and Hintermann’s (1997) profiles of the labor migrants from Hungary, Poland, and the Czech and Slovak Republics are indicative of the CEE migrant in general: An estimated two-thirds of the CEE migrants were male; they were predominantly young and of the productive employment age—75 percent younger than forty years and 40 percent younger than twenty-four years. They were employed in the industrial, construction, and
service sectors and in unskilled jobs rather than in skilled and technical positions, albeit educated and multilingual.

The postaccession CEE migrants tended to be young, single, and well educated, but employed in low-skilled occupations, as discussed in Meardi (2007); Woolfson (2006); Favell (2008); and Pollard, Latorre and Sriskandarajah (2008). Drinkwater, Eade, and Garapich (2009) find that these immigrants, unlike their pre-enlargement counterparts, had limited work experience in their origin country. Additionally, Dustmann (1996a, 1996b) suggests that the proportion of the population that will move to another country and perhaps return within a certain period of time is much higher than the proportion that will permanently migrate to a foreign country. Fassmann and Hintermann (1997) suggest that this circular nature of CEE labor migration to Western Europe allows the returning migrant to provide information and support for the budding migrants. Furthermore, Piracha and Vickerman (2001, 1) suggest that “within Europe, most migration is not permanent, but part of a process of mobility in which both return and serial migration are natural economic responses to a dynamic economy.” In the case of Poland, Frejka, Okólski, and Sword (1998) suggest that an increase in migration of the same individuals contributed to the migration volume rather than an increase in the number of people.

Migration Decisions: Pecuniary and Nonpecuniary Considerations

Migrants are not a random sample of the origin country’s population. Rather, they are typically self-selected from the larger population and characterized as rational actors making optimal decisions on locations yielding the highest expected earning returns. There are ample discussions within the literature on migration selectivity and its
characteristics (Roy 1951; Borjas 1985; Heckman 1979; Lee 1983; Dubin and McFadden 1984; Portes and Rumbaut 1996; Dahl 2002; Hatton and Williamson 2002; Bourguignon, Fournier, and Gurgand 2007; Brücker and Trübswetter 2007; Bayer, Khan, and Timmins 2008).

The country-specific effects of language and culture are important factors when discussing migration (Alvarez-Plata, Brücker, and Silverstovs 2003). Language can be a means for the self-selection process for the destination country and in the labor force. There is evidence of an increase in immigration when language and culture in the destination country are familiar to the migrant, as discussed in Fassmann and Hintermann (1997). Fassmann and Hintermann emphasize that CEE migrants tend to gravitate to the Germanic countries—Austria, Germany, and Switzerland—as German is a common second language. Limited ability to self-advocate in the destination country’s language makes positive societal integration difficult. Massey et al. (1998) suggests immigrants may encounter economic difficulties because some of their capabilities, such as professional or language skills, might not be perfectly transferable in the new society, as it involves learning new languages and customs. Moreover, concern about failed integration within destination countries has been one factor explaining the emphasis on language learning for economic and social integration. France, Germany, and the United Kingdom, for example, have measures to promote destination-country language learning for immigrants.

**Destination Countries**

Each country’s migration policies have as their primary objective minimizing any drain on the national welfare system (Borjas 1995). Several approaches were undertaken
by the destination countries to manage labor migration: (1) quotas or worker permits for preferred occupations (such as in Germany and the United Kingdom); (2) labor demand approaches (Ireland, Sweden, and the United Kingdom); and (3) point-based systems (the United Kingdom and Denmark). For more information, see Table 6 (European Migration Network 2007; OECD 2010). Each country found that labor migration from the A8 countries had a positive effect on their economies, enhancing growth and lowering unemployment (European Commission 2006).

Table 6

*Member States’ Policies Towards Workers from the New Member States*

<table>
<thead>
<tr>
<th>Member State</th>
<th>Workers from the A-8 to EU-15</th>
<th>Workers from A-2 to EU-25</th>
</tr>
</thead>
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<tr>
<td>Denmark</td>
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<td>Restrictions with simplifications</td>
</tr>
<tr>
<td>France</td>
<td>Free access (1 July 2008)</td>
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</tr>
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<td>Germany</td>
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<tr>
<td>Sweden</td>
<td>Free access (1 May 2004)</td>
<td>Free access</td>
</tr>
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<td>United Kingdom</td>
<td>Free access (1 May 2004), mandatory worker</td>
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</tr>
<tr>
<td></td>
<td>registration scheme for monitoring purposes</td>
<td></td>
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</tr>
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<td>Romania</td>
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</table>

Source: Adapted from Directorate-General for Employment in European Commission (2008, 111); *Restrictions also on posting workers in certain sectors.

The United Kingdom, Ireland, and Sweden were among the few Western European countries that granted open access to their labor market by imposing no
restrictions on the new EU member states immediately after accession. The United Kingdom, France, Denmark, and Sweden were net immigration countries, experiencing constant flows since the 1960s. Ireland became a net receiving country in the 1980s in tandem with its economic growth. Yet, migrants from the NMS represented less than 1 percent of the working-age population in all of these countries, with Ireland proportion being the highest, an estimated 3.8 percent of the working-age population. Nationals from the Czech Republic, Hungary, Latvia, Lithuania, and Poland tended to take up residence in the United Kingdom. Slovene migrants tended to prefer Germany, with Estonia having stronger ties with Finland. By 2008, all destination countries but Denmark and Germany had fully opened their labor markets to A8 nationals; Germany kept its labor markets regulated until 2011.

United Kingdom

The United Kingdom allowed for unrestricted entry to their labor market at the time of the A8 accession in 2004 and experienced high levels of immigration. Polish immigrants constituted the majority of the applicants proportionally and absolutely, followed by Lithuanians (11 percent) and Slovakians (10 percent; UK Border Agency 2007). From 2001 to 2006, migration contributed 0.5 percent each year to working-age growth. For the A10 nationals, immigration is largely short term, with many of the A8 nationals registering with the worker registration schemes. By 2007, temporary employment was 60 percent, indicating the intent to stay for less than 3 months (“Accession Monitoring Report 2004–2008” 2009).

By the A2 accession in 2007 and in response to the large immigrant inflows, there was a concentrated effort to target gaps in specific economic sectors (agricultural and
food workers), students, and high-skilled immigrants. Additional requirements after entry such as mandatory registration programs, such as the worker registration scheme, were instituted for CEE labor migrants to monitor labor-market developments. However, it is important to note that the worker registration schemes can only capture the applications and not the immigrant population.

Ireland

In the 1990s, Ireland experienced significant economic growth spurring the return of expatriates. Unemployment fell from double digits in 1993, an estimated 15 percent, to less than 5 percent in 2000. As a result of Ireland’s economic growth and in response to the labor and skill shortages, Ireland transformed from a net emigration country to attracting high-skilled EU immigrants (Ruhs 2005). The foreign-born proportion doubled in six years, from an estimated 3 percent in 1999 to an estimated 6 percent in 2005.

Even with lower economic growth, migration continued into the 2000s, with Ireland still above the EU average (Schweiger and Wickham 2005a, 2005b). Many of the CEE migrants were from Poland, Latvia, and Lithuania (Central Statistics Office Ireland 2008). The migrant profile is similar for these countries: unmarried, average age 27.5 years with 70 percent between the ages of twenty years and thirty-five years. Immigrants from Latvia and Lithuania were slightly older.

The Irish government managed immigration to its advantage. The magnitude of migration to Ireland is reflected in the Personal Public Service data, for which all migrants are assigned a number for employment, benefits, and driving licenses. The Personal Public Service reflects all registered immigrants, not solely labor migrants. Unlike the United Kingdom, Ireland did not require the accession nationals to have
additional certifications to work. As discussed in Ruhs (2005), “fast track” visas were introduced in 2000, which Ruhs and others attribute to the EU enlargement. Barrett and Duffy (2008) suggest that the highly skilled nature of the Irish population is being diluted as a result of increased immigration from the CEE countries. However, these migrants tend to have lower occupational attainment than their national counterparts. Employment tends to be in the low-skill, low-wage occupations despite strong educational backgrounds. In 2003, the government encouraged employers to prioritize workers from the new EU countries when recruiting outside of Ireland to fill any low-skilled positions from the EU labor market.

**France**

Since 2002, France has moved towards migration management (*immigration choisie*), as it has been stymied by high unemployment. France suffers from statistical discrepancies regarding its foreign labor force, which reduces any reliable assessment of the number of CEE immigrants. For example, French immigration data delineates between immigrants (*immigrés*) and foreigners (*étrangers*). As permanent residents, immigrants are considered individuals who were born abroad as foreign citizens and continue to be counted as such until they obtain French citizenship. Foreigners are individuals who do not have French citizenship. According to Institut National de la Statistique et des Études Économiques (2006), immigrants account for approximately 25 percent of the population growth, which is lower than other Western European countries.

Labor migration has been selective with more restrictive immigration policies, which include stipulations for residency permits for certain qualified individuals responding to labor shortages and integration contracts (*contrat d’accueil et intégration*)
for those who want permanent residency. Reform measures have extended the timeframe for naturalization with the creation of a digital fingerprint database, as well as increased scrutiny on convenience marriages under the policy of *immigration choisie plutôt que subie*. Yet, while these are policies restricting immigrants who are not positive contributors to the economy, high-skilled and educated immigrants are welcomed.

Despite an absence of large inflows from the CEE region, immigration is viewed negatively, as there is a perception of native worker displacement, lowered wages, and exploitation of welfare benefits. Most notably, this was evidenced by the failed campaign for ratification of the 2005 European Constitutional Treaty, and the supposed immigrant threat symbolized by the *Polish plumber* (*plombier polonais*). Since the A8 and A2 accessions in 2004 and 2007, there has not been any significant increase in legal and permanent immigration to France. In 2004, jointly with the majority of EU states, France had initially restricted the free movement of workers from CEE countries. Since 2005, citizens of Estonia, Latvia, Lithuania, Poland, Slovenia, Slovakia, the Czech Republic, and Hungary benefit from an accelerated process to obtain work permits if they fit into certain economic sectors for which France lacks labor, primarily in hospitality, culinary, construction, and agriculture. For Bulgarian and Romanian nations, France ended restrictions in 2011, allowing their migrants to obtain accelerated work permits.

**Germany**

Unlike the other destination countries in this study, Germany shares borders with Poland and the Czech Republic. With the collapse of the Berlin Wall, Germany was the main destination country for ethnic German repatriation (*Russlandeutsche*) for the CEE immigrants. Despite labor-market barriers, CEE cross-border migration, specifically
seasonal workers to Germany, was larger than to other Western European countries. Until 1997, Germany had bilateral labor agreements with the CEE countries. These treaties served to bolster and improve economic cooperation between Germany and the CEE countries, and supported their respective labor markets. Fischer (1994) suggested these treaties de jure limited immigrants’ entry; however, de facto, CEE nations filled the labor-market gaps. As with Ireland, employment in Germany is required to be filled with either German or EU nationals, allowing for a rotation principle while simultaneously controlling labor inflow access to Germany. Reform to the Fundamental Law in 1991, which limited asylum seekers and later the inflow of aussiedler, and sluggish economic growth have tempered net migration.

**Sweden**

Sweden had the lowest number of CEE migrants of all these destination countries, most likely due to language, fewer employment opportunities, a high degree of public-sector employment and labor-market regulations favoring nationals. As with the United Kingdom and Ireland, Sweden allowed for the free movement of labor with both the A8 and A2 accession countries rather than opting for a transition period. Sweden has high minimum wages and an extensive welfare system when compared to other Western European countries. The Migration Integration Policy Index III (MIPEX 2011) ranks Sweden as one of the best migration integration policies of all the EU destination countries under study. With a two-year initial visa, for example, an immigrant has access, education, and job-market opportunities identical to those of Swedish citizens and the right to vote in local as well as regional elections. Additionally, an immigrant may
sponsor his or her family immediately, with proof of sufficient income and housing prior to the family’s arrival.

As with the other destination countries, CEE migration into Sweden was labor related. In the early 1990s, immigrants accounted for approximately 10 percent of the population. By 2008, foreign-born people accounted for an estimated 14 percent of the population, with Poland being one of the top CEE sending countries. NMS migrants closely mirrored Swedish nationals in education levels, thereby having lower employment rates when compared to Swedish nationals, as discussed in Doyle, Hughes and Wadensjö (2006) and Gerdes and Wadensjö (2009). However, Gerdes and Wadensjö (2009) demonstrate that NMS immigrants were overrepresented in construction and agriculture and underrepresented in educational and public-administration sectors.

**Denmark**

Denmark does not regard itself as an immigration country, as it experiences more emigration than immigration. Denmark has a relatively homogeneous population and a strong national identity. Until recently, immigration flows were moderate. Most immigrants in Denmark come from other Nordic, EU and North American countries, usually to work or study for a limited period of time. The Danish Aliens Act (1983) regulates foreigners’ right to enter and reside in Denmark. Since 2002, Denmark has restricted inflows but welcomed the highly skilled and educated immigrant. CEE nationals entering Denmark are free to enter and set up a self-employment business, while entry to take a job is based on acceptance of an application for residence and work permits. Yet by 2006, immigration to Denmark was characterized primarily by asylum seekers or by familial reunification.
Denmark experienced a negative birthrate and negative population growth until 1984, but this was curtailed with the increased numbers of immigrants from non-Western countries. Although it has become more difficult for immigrants to gain residence in Denmark, the stock of immigrants and their descendants has increased since 1990. In fact, migrants from the new EU accession countries, especially Poland and the Baltic nations are found within the construction, agriculture, consumer, and cleaning industries.

Structure of the Dissertation

In order to gain an understanding of the relationship between labor immigration and economic growth in the destination countries, the dissertation is structured as follows: Chapter II reviews the neoclassical and human-capital migration theories and a comparative analysis within the context of CEE labor migration. Chapter III provides an overview of the relevant literature. Chapter IV sets forth the research questions, hypotheses, methodological approach and statistical analyses used as part of this dissertation. Chapter V details the results of the statistical analyses. Chapter VI offers a discussion of the results and ends with some concluding comments.
CHAPTER II
THEORETICAL FRAMEWORK

Introduction

Many econometric theoretical frameworks that attempt to predict migration stock or migration flow are macroeconomic models. These models, either directly or indirectly, obtain their data from aggregated individual decisions. As such, these frameworks explain migration by wage differences between destination and origin countries, labor-market, institutional, and distance variables which proxy migration costs and legal impediments to migrant destination entry. Indeed, many of the migration theoretical concepts are variations on Ravenstein’s gravitational laws from 1885 and 1889, in which migration is viewed as a spatial construct of push and pull factors, generating an uneven geographical distribution of labor and capital. Unfavorable conditions in the origin country, such as high unemployment and low income, push people out. Favorable conditions in the destination country, such as high income potential, colonial relationships, and common language, pull them in. Within the global labor market, migration tends to move from poor, low-wage countries to high-wage destination countries when the wage differentials are larger than moving costs. Most migration, therefore, results from a combination of both push and pull factors. Lee (1966) redeveloped Ravenstein’s theory, emphasizing the push factors and the impact of the intervening obstacles, such as distance, immigration policies, and family and marital status. Yet, the simplicity of the fundamental gravity models and the variables of distance and population neither adequately nor sufficiently explain the details of migration. In an extension of Ravenstein’s model, Zipf (1946) suggests that the flow between two places
is directly proportional to the product of the populations of the origin and destination countries, and inversely proportional to the distance between them. Furthermore, building on Ravenstein’s and Zipf’s models, the Roy (1951)–Borjas (1987) model incorporates self-selection which suggests that an increase in an origin country’s reward to skill results in an increase in migration and a structural change of migrants to a more skilled group. Individuals with high returns in the destination country will migrate; all others will stay. While the complexity of migration theories may have changed since Ravenstein, Zlotnik (1998) notes the conceptual foundation remains intact as the underlying assumption of the push and pull factors.

The neoclassical economic construct has been an influential and quantifiable approach to labor migration. In part, this dissertation posits that CEE nationals’ migration to Western Europe can be explained within a neoclassical framework. Neoclassical economic theories account for much of the research on the causes of migration in terms of income, cost of living, employment-skill differences, welfare-system extent and breadth, and quality of public goods, or what Samuelson (1954) defines as a collective-consumption good. With an assumption of full employment, migration is viewed as a response to labor-market disequilibrium in wage differentials and employment opportunities. Migration is an investment whereby the migration returns are higher wages from employment in the destination country, and are greater than the pecuniary and nonpecuniary costs. Hicks (1932, 76) characterizes the causes of migration as “the difference in net economic advantages, chiefly differences in wages.” Individuals move from low income to high income, causing labor to become less scarce in the destination country. Moreover, capital should move in the opposite direction. Within this framework,
migration is seen to be both a consequence of wage differentials and as a method to equalize differences in wages and living conditions on an international level.

In successor models, the use of macro data in the estimation of migration is predicated on the destination country’s average income information representing migrants’ expected income upon arrival (Massey et al. 1998), assuming no individual-specific unobserved factors simultaneously influence the decision to migrate. Taylor and Martin (2001) suggest that the migration decision is a calculated response by the individual to the income differentials between the origin and destination countries. In other words, individuals migrate from the origin country to the destination country only if the present value of expected benefits exceeds the expected value of the anticipated moving costs.

Human-capital theory, which views migration in terms of migration decisions, counterbalances the perspective of neoclassical theory. One distinction between the theories is the extent to which they acknowledge individuals as active participants in the migration process. Migration, according to Sjaastad (1962, 83), is understood to be an “investment in the productive use of human resources.” Human-capital theory not only includes labor-market variables, but also considers the importance of migrant heterogeneity, such that the probability of gaining employment and wages in the destination country is reliant on the migrant’s skill level and investment in the destination country’s specific human-capital needs. Thus, income expectations are predicated largely on employment opportunities.

Clearly, there are limitations to human-capital theory, as discussed by Brücker, Damelang, and Wolf (2007). Wage differences between the destination and origin
countries and the employment rate in the destination country both have a positive impact on migration. At a given wage difference between the origin and destination countries, the income level in the destination country is expected to have a positive impact as it eases liquidity constrictions. Lastly, Brücker, Damelang, and Wolf (2007) state that the scale of migration is expected to decline with geographic distance.

Neoclassical Macroeconomic Theory

Neoclassical economic theory accounts for much of the research on the causes of migration. This theory explains migration in terms of spatial–economic equilibrium in supply and demand for labor. Neoclassical theory views migration as an investment where the returns from migration, such as increased wages in the destination country, outweigh the costs. Thus, migration is a response to wage differences. Its foundation is within the rural–urban migration context, extrapolated and adjusted for international migration. Clearly, Todaro (1969, 139) positions migration within economic history as a “gradual but continuous transfer of economic agents from rural based traditional agriculture to urban oriented modern industry.” Indeed, Borjas (1989) suggests that international migration is based on both destination choice and a cost–benefit analysis. The consequence of labor movement from a lower-wage origin to a higher-wage destination country is an increase in labor supply and lower wages, with the process having an opposite effect in the origin country. Wage differentials cause individuals to move from low-income to high-income regions. Layard, Nickell, and Jackman (1994), Bauer and Zimmermann (1999), Boeri and Brücker (2001), Dustmann et al. (2003), and Munshi (2003) suggest that CEE migration to Western Europe bears out the tenets of
neoclassical theory, with the variables of wage, income differentials, and probability of employment as the primary determinants of migrants’ behavior.

The Heckscher–Ohlin–Samuelson model (Ohlin 1966; Heckscher 1949; Samuelson 1948, 1949) characterizes international migration in terms of mobility of goods and factors of production between countries engaged in international trade. A country will produce and export items using a relatively abundant or cheaper factor of production. Assuming a free-trade configuration, there is an expectation of equalization of factor prices because of the product flows. When extrapolated for labor migration, the decision to migrate can be viewed as another mechanism to equalize markets. Thus, in a perfectly neoclassical world, factor-price equalization will eventually show a convergence between wages in the origin and destination countries, with migration occurring until the wage differences disappear to the level of migration costs. Further discussion on this can be found in Lewis (1954), Ranis and Fei (1961), Schiff (1994), and Harris and Todaro (1970). Thus, neoclassical theory highlights migration decisions as determinant factors of migration in what Lewis (1954) describes as the regional prosperity disparities of an origin country.

The Roy–Borjas model (Roy 1951; Borjas 1987) predicts negative selection of the origin-country migrant, as the return to skills and earnings inequality may be larger for the origin country than for the destination country. Therefore, migration incentives for low-skilled workers may be greater than those for high-skilled workers, with migration costs negatively correlated with skills. Even with larger returns, low-skilled workers face a larger migration cost, which translates to a lower chance of migration. Similarly, high-skilled, highly educated workers may have ready access to the social and technological
networks which make migration less costly. For Borjas (1987), there needs to be a strong positive correlation with migrants’ wages. Any negative correlation between migration cost and skill level then becomes an empirical inquiry. Therefore, negative selection is more likely to occur in less developed, geographically close countries in which individuals with the strongest incentive to migrate are those with relatively low skill levels. Taylor and Martin (2001) propose that individuals with higher expected earnings due to education, abilities, and experience are more likely to migrate. It is important to note that skill bias may have a negative impact on the origin country as extensively discussed in the *brain drain* literature (De Haas 2007) noted in Chapter I. Furthermore, according to Dimova and Gang (2007), migration self-selection biases estimation of returns to human capital in different skill levels.

*Harris Todaro Model*

Todaro (1968, 1969) and Harris and Todaro (1970) advance the neoclassical model into the more commonly applied explanation of regional disparities, such that migration is driven by expected rather than actual wage differentials. Their theoretical framework for labor migration emerges within the context of intersectoral labor-market deficiencies and responses to income differentials to explain internal migration in less-developed economies. The Harris–Todaro (1970) theoretical framework was developed to explain rural-to-urban migration patterns in developing countries that are in the throes of increasing unemployment. Clearly, this was an attempt to dispel what they felt was a vacuous description of “the bright lights of the urban setting acting as a magnet to lure peasants into urban areas.” (Harris and Todaro 1970, 126). Regions with labor shortages
relative to capital are characterized by high equilibrium wages. Conversely, regions with large labor supply relative to capital are characterized by low equilibrium wages.

The Harris–Todaro approach of explicitly using expected wage differentials has been broadly generalized in formal explanations of international migration as it reflects the uncertainty immigrants face about successfully locating better-paying jobs in another location. Much of the migration literature follows Harris and Todaro on the role of employment (proxied by unemployment) and wages in explaining migration. Their theory suggests what Ranis and Fei (1961) call an economically rational choice for the individual and the spatial redistribution of the factors of production. As a result of the migration process, labor supply decreases and wages increase in the rural region (origin country). Conversely, in the urban region (destination country), labor supply increases and wages decrease. Any remaining wage differential reflects migration costs. This explanation is often referred to as the Harris–Todaro equilibrium. However, the creation of new urban employment opportunities could exacerbate the problem of urban unemployment instead of improving it. Raimondos (2003) refers to this as the Todaro paradox. Any policies designed to reduce urban unemployment are bound to go wrong: By attracting more immigrants, they increase rather than decrease urban unemployment.

Yet, the ability to migrate based on cost does not allow for the poor individual to migrate, or more accurately, to migrate far. More affluent individuals migrate greater distances, as discussed in Massey et al. (1998), Dustmann et al. (2003), and De Haas (2007). Thus, migration rate increases with a country’s affluence, as most individuals are able to bear the migration costs. However, the fact that poor individuals tend not to migrate great distances forms the premise for a migration hump or the relationship
between migration and the origin country’s development. Migration will increase with income level until an income threshold is met. Once the threshold is met and a sustained economy exists, migration levels decrease, as do a person’s reasons for migrating.

*Neoclassical Successor Models*

Todaro (1969) suggests that changes in wages and unemployment associated with economic cycles affect the optimal timing of migration by influencing rates of return in the short run. Indeed, Todaro (1969) expands neoclassical theory, adding a coefficient for the probability of employment—and, conversely, the probability of being unemployed—in the destination country. The Harris–Todaro model (1970) has been adjusted to include other variables beyond employment and expected income, namely the informal urban sector. Furthermore, Harris and Todaro (1970) suggest that the migration decision is based on income maximization and wage differentials between origin and destination countries. Yet, any gains from higher income should be counterbalanced by other considerations, such as migration and opportunity costs and temporary unemployment incurred from origin move to destination installation. Bowles’s (1970), Straubhaar’s (1988), and Blanchflower and Oswald’s (1994) findings suggest that wages are inversely related to unemployment. In contrast, Corden and Findlay (1975), Fields (1975), Neary (1981), Gupta (1986), and Krichel and Levine (1999) each suggest that migration is in response to regional disparities in both the economic and amenity characteristics. Hatton (1995), Karras and Chiswick (1999), and Fertig and Schmidt (2000) all suggest the importance of distinguishing between short-run and long-run migration determinants and understanding the effect of short-run economic changes on migration.
Braun (1993) and Barro and Sala-i-Martin (1995) present macroeconomic neoclassical growth models with migration factors that show how transitional dynamics and other adjustments work. Barro (1991, 1995) and Blanchard and Katz (1992) both address the impact of immigration on growth by showing that a nation’s subsequent economic growth is significantly and positively related to its preexisting stock of human capital, measured by its citizens’ level of education. This finding is consistent with greater human capital causing GDP per capita to grow more rapidly. Barro and Sala-i-Martin (1992a) present additional empirical evidence that labor mobility within and between nations can and has facilitated desirable economic growth, and that it represents one of the most important mechanisms for interregional and international risk sharing.

Tunali’s (2000, ii) analysis of the move or stay decision suggests individuals are willing to “invest in a proposition that has a high probability of yielding negative returns because of the potential for a large payoff.” Jasso and Rosenzweig (2005) suggest that self-selection rather than any destination-country migration policies accounts for differences in immigrant skills. The empirical findings of Belot and Hatton (2008), Ortega and Peri (2009), and Grogger and Hanson (2011) speak to the self-selection topic with the use of macro data. Thus, migrant selectivity in the neoclassical paradigm can be merged with human-capital theory and the individual’s decision to migrate.

Limitations to Neoclassical Theory

Due to its one-dimensional nature and its focus on individualism, neoclassical theory is not grounded in the reality of market imperfections and other structural contexts that may spur migration flows. Instead, neoclassical theory places migration solely within an expected-income discourse, ignoring other plausible and correlational elements.
Moreover, it neither adequately explains the differences in emigration among countries nor takes into consideration other factors such as immigration policies. Given the economic disparities between countries, immigration should be much higher than the actual observed levels. Assuming individuals have perfect information about wages and employment in a given destination country and the extent of the disequilibrium between the origin and destination countries is unrealistic. Importantly, migration does not occur in a vacuum. The assumption a homogenous, interchangeable labor between countries ignores—according to Greenwood (1985), Willis (1986), Eaton (1992), and Begum (1999), and Fields (2005)—migration’s complexities and consequences, thus failing to capture the dynamic nature of labor movement. Human beings cannot be reduced to rational gain-maximization agents minimizing risk aversions among prospective immigrants.

Easterlin (1980, 391) offers that Todaro’s (1969) and Harris and Todaro’s (1970) models are incomplete rather than incorrect, viewing them as a “central characteristic rather than a literal representation.” Similarly, Hoddinott (1994) argues the models fail to explain the role prospective migrants play in the decision-making process, and thus fail to provide any insight into how costs and benefits are shared. Additionally, neoclassical theory is not sufficient to address selective migration. Moreover, Bauer and Zimmermann (1999) find that the Todaro framework does not fully explain or predict interregional migration. They argue that while wage and employment differentials may be statistically significant predictors, they had the expected signs of the coefficients only 50 percent of the time. Specifically, as it relates to the CEE migration trends, accession into the EU did
not release a flood of migration; migration levels were not as elastic to wage and employment differentials as the theory predicted.

Taylor and Martin (2001, 8) suggest human-capital theory “has the key implications that the types of individuals selected into migration are those for whom, over time, the discounted income or expected-income differential between migration and nonmigration is greatest and/or migration costs are lowest.” Also, Taylor and Martin (2001) fault the model for not including any factors beyond expected income and the impact on the origin country’s economy. Lastly, while beyond the scope of this dissertation, it is acknowledged that the Harris–Todaro model does not explain temporary and return migration, remittance flows to the origin country, and social networks, for example, in studying the dynamic interplay of migration. See, for example, Kritz and Zlotnik (1992), Faist (2000), and others for detailed discussions.

Human-Capital Theory

Human-capital theory is commonly used to explain migrants’ decisions other than wage maximization. Human-capital theory has its genesis in investment theory, whereby a corporation’s decision to invest depends on whether it is an economically viable decision. Beginning with the seminal works of Sjaastad (1962), Schultz (1963), Becker (1964), and Mincer (1974), human-capital theory treats migration as an investment decision, underscoring individuals’ actions in their own self-interest. A presumptive stance is taken that labor income is returned as human capital; as such, migration is, as Becker (1962) describes, an investment in human capital to maximize the net present value of a person’s future earnings.
While migration is a response to wage differentials, which are an important component in migration decisions, they are not sufficient as an explanation of divergent migration preference. Depending upon the type of labor demand in the destination country, human-capital theory allows for migration selectivity, conditional on the specific skills, educational backgrounds, and propensity to migrate of a potential migrant. Cost–benefit analysis, as well as human-capital components, should also be considered as migration factors (Becker 1962; Sjaastad 1962). Bauer and Zimmermann (1999) suggest that migration depends on the structure and segmentation of labor markets, as well as migration and other social policies, thus giving the immigrant the chance to be employed in the destination country. Therefore, unlike the neoclassical theory—which explains migration with two main explanatory variables—wages and income differentials—human-capital theory explains migration as heterogeneous and dynamic.

As a determinant of migration, human capital, which Becker (1964) further divides into general and specific human capital, consists of the income-producing skills, knowledge, individual experience, and other factors that increase economic productivity (OECD 2001). Lucas’s (1988) model, based on constant marginal returns to human-capital accumulation, matches observed migration patterns because people of each skill level are more productive in high-human-capital environments. This explains migration of highly skilled workers from countries with low levels of human capital to countries with high levels. Lucas (1988) simultaneously emphasizes that the international patterns of migration and wage differentials are in opposition with a neoclassical model and that human capital is not measurable. Assuming equal technology was available in all countries, human capital would not migrate away from origin countries where it is scarce.
Lucas (1988) acknowledges that because of technological and institutional differences, migration may not reduce the wage gaps between origin and destination countries. Lucas (1988) further suggests that countries with higher initial stocks of human capital do not grow faster than those with lower initial stocks of human capital. Moreover, such countries do not necessarily converge in income per capita.

Wooden (1994, 220) suggests that “differences in pay, occupational status, probability of employment, and so forth, between immigrants and natives reflect differences in the average productive capabilities of the two groups,” eliminating income differentials over time. As discussed in Sjaastad (1962), Borts and Stein (1964), and Pickles and Rogerson (1984), human-capital models represent an effort to provide a microeconomic foundation for migration theory, allowing for testable hypotheses to explain how an economically motivated individual behaves. Therefore, migration occurs if the net returns are larger in the destination country than in the origin country.

The decision to migrate is affected not only by pecuniary costs, but also by such nonpecuniary social costs as the contextual variables of age, sex, familial status at the time of migration, the timing of migration, and the availability of social networks as discussed in Mincer (1978), Massey (1990), and Cerrutti and Massey (2001). Yet, Sjaastad (1962) does take into consideration the nonpecuniary gains in the destination country, as these are not accounted for in the returns to human-capital investment. Rather the nonpecuniary differentials between the origin and destination countries will be accounted for by differences in the cost of living. While familial status may increase the costs of moving, ethnic and social networks may reveal important information about the destination country and its labor market. Migration is also affected by the characteristics
of the labor market and income distribution in the origin and destination countries (Portes and Bach 1985; Borjas, Freeman, and Katz 1992; Chiswick 2000), the admission policy of the destination country (Chiswick 1987; Borjas 1993; Reitz 1998), and migrants’ legal status (Taylor 1987; Borjas 1993). However, Burda (1995) expands human-capital theory by introducing uncertainty about wage differentials and the real gains of migration, and Bauer (1995) adds migration costs. They each suggest that individuals may delay their move and wait for new information even when the expected wage gain is greater than the costs of moving, which could explain the coexistence of large wage differentials and low migration.

Age is a significant predictor of labor migration, such that the decision to migrate depends on where an individual is in the life cycle, as presented by Clark et al. (2002) and Hatton and Williamson (2002). Becker (1964) identifies the importance of age: the older a migrant is, the lower the expected gain from migration. Burda (1993, 452) confirms, “age is strongly negatively associated with the desire to migrate (quadratic terms were insignificant).” Moreover, Wildasin (2000) suggests that human-capital investment increases specialization. Therefore, the movement of skilled migrants, or brain drain, harms the origin country, as the investment in education is lost. Mountford (1997) and Beine, Docquier, and Rapoport (2001) posit that migration from origin to destination stimulates human-capital investment by those who do not migrate, exacerbating the origin country’s brain drain.

Various studies show that education level is a predictor of one’s likelihood of migrating: a more educated migrant may be in a better situation to gain information about a potential destination country, thus reducing costs. Borjas (2000) puts forth that younger,
more educated, and more able-bodied individuals enjoy higher returns, which is consistent with human-capital theory. Friedberg (2000), for example, discusses the extent to which education is transferable across borders and rewarded in a destination country. Consistent with human-capital theory, Becker (1962), Schultz (1961), and Phelps (1967) analyze the interaction between education and economic growth, whereas Schultz (1961) and Becker (1962) analyze the rate of return to investment in education. Nelson and Phelps (1966) and Phelps (1967) suggest that education is important as a factor to facilitate, generate, and adapt to technological change, rather than as a factor of production like labor or land or machinery under a given state of technological knowledge. An increased demand for high skill levels positively affects international movement of highly educated people. A higher educational attainment in the origin country, all else being equal, increases the likelihood an individual will migrate, as presented in Carrington and Detragiache (1998) and Docquier and Marfouk (2007).

If the decision to migrate is increased by higher educational and skill levels, estimating the return becomes complex. Human capital is an investment specific to the individual and subject to depreciation. Should the labor market reduce relative wages in a given occupation, there will be a capital loss, with those workers either facing lower wages or making additional investments to increase their earnings. Should wages in an occupation be adversely affected, then migration may be optimal. Should the relative-wage effect strain the occupational earnings, migration becomes an option only if the individual acquires new education and skills, dependent upon age and the value placed on those new human-capital components.
CHAPTER III
REVIEW OF RELATED LITERATURE

Introduction

The current migration discourse is grounded in partial-equilibrium static models, which provide, at best, guidance for the expected short-run effects on labor markets. Static analysis anticipates that an increase in a production factor reduces the relative price of the good produced, suggesting falling wages after an increase in the labor supply. In the presence of downward wage rigidity, unemployment should rise. Methodological differences notwithstanding, the literature on individual preferences for immigration examines the relationship between the labor-market impact of immigrants and preferences in the destination country. The existing literature on European migration (1) describes the political developments in several EU countries (Fassmann and Münz 1994; Cornelius, Martin, and Hollifield 1994; Uçarer and Puchala 1997; Castles and Miller 1998; Angenendt 1999), (2) analyzes EU policy developments (Geddes 2000), or (3) combines both political and policy developments in the EU (Geddes 2003; Faist and Ette 2006). The economic-migration research concentrates on the cost–benefit arguments of fiscal and labor-market impacts (i.e., immigrants are a burden on the national treasury and displace native workers), neither of which is well supported (Smith and Edmonston 1997; Coppel, Dumont, and Visco 2001).

Furthermore, there is strong evidence for the importance of economic incentives in migration decisions. Linkages between labor migration and potential migrants are consistent with general patterns of empirical findings. Macroeconomic effects depend on labor-market responsiveness and the character of the migrant labor, as either a
complement to or a substitute for native labor. Any differences in per-capita income may determine the direction of net migration flows. Thus, labor migration reflects, in part, disparities in wages, working conditions, inflation, employment growth, and unemployment rates, all of which influence native workers’ and immigrants’ wages. Lastly, it is also within economic reasoning, as Gurak and Caces (1992) suggest, that the migration incentive must be greater than any moving costs. By contrast, Blanchflower and Oswald (1994) suggest there is a downward sloping convex curve linking local unemployment and wage levels.

To assess the impact of migration, the purpose of this dissertation is to evaluate the effects of labor migration from the A10 economies to destination countries (the United Kingdom, Ireland, France, Germany, Denmark, and Sweden) using explanatory variables of labor-market indicators—gross domestic product (GDP) per capita, wages, unemployment, and long-term unemployment as a proxy for discouraged workers. The dissertation follows the extant literature on the determinants and consequences of migration, as discussed in Burda (1995) for Germany; Ahn, Jimeno, and Garcia (2002) for Spain; Drinkwater et al. (2003) for the CEE countries; Krieger (2004) for the accession countries; Liebig and Sousa-Poza (2004) and Epstein and Gang (2006) for Hungary; Fidrmuc and Huber (2007) for the Czech Republic; Coppel et al. (2001) for OECD countries; and Fouarge and Ester (2007) and Bonin et al. (2008) for the EU25. Country-specific effects are important, as they can influence macroeconomic effects of migration and explain differences in the level of migration between states (Jasso et al. 1998; Rotte and Vogler 1998; Karemera, Oguledo, and Davis 2000; Fertig and Schmidt 2001; Hatton and Williamson 2002; Clark et al. 2002). Additionally, Straubhaar (2001)
discusses country-specific effects related to CEE regions without histories of free migration. However, Boeri and Brücker (2001) suggest results from models that fail to consider whether country-specific effects are biased. According to Alecke, Huber, and Untiedt (2001), such models may overestimate migration. Heterogeneity in the literature may also be due to the use of cross-country information, which implies that any findings are a combination of either cross-country variation or within-country longitudinal variation. Detailed discussions of the impact of migration and development can be found in Bauer and Zimmermann (1999), Greenwood (1985), Straubhaar (1986), Borjas (1989, 1994, 1999), Massey et al. (1993), Zimmermann (1995), Ghatak, Levine, and Price (1996), Molho (1986), IOM (1998), Mitchell and Pain (2003) and Lucas (2005).

Gross Domestic Product

Mayda (2010) describes migration as a complex relationship between origin-country GDP and emigration, as low income constitutes both an incentive and an impediment to movement. GDP is a standard measure used to evaluate the overall economic health of a country. GDP depends on the rates of return to capital and labor: more immigrants per year, ceteris paribus, suggests a greater growth of GDP in the destination country in the short term, without affecting average wages or labor productivity. Borjas (1999) suggests that any net short-term impact from immigration leads to a few tenths of a percent change in GDP.

Tamura (2007) discusses the relationship between the magnitude of immigration and the effects on wages, unemployment, and public-sector finances. Two dominant approaches to the economic impact of immigration on the public sector of destination countries exist. First, generational accounting methods (Auerbach and Kotlikoff 1987)
are used to assess the total cost–benefit and long-term sustainability of fiscal policies for the national economy. The second—an approach that analyzes immigration surplus in the destination country’s labor market—calculates the gain of immigration as a percentage of GDP (Poot, Nana, and Philpott 1988; Borjas 1994). Under certain conditions, the loss in income for native workers is counterbalanced by the increase in income accruing to the owners of capital, which results in an increase in national income.

Loungani and Sheets (1997) and Bruno and Easterly (1998) present evidence of the strong negative impact of inflation on subsequent real GDP growth for transition countries. S. Fischer, Sahay, and Vegh (1996) use an alternative data method, “stabilization time,” denoted by $T + j$, where $T$ is the year the stabilization program was implemented and $j$ is the number of years preceding or following the year of stabilization. In transition economies, real GDP growth and inflation recover during the year of stabilization, becoming positive two years after stabilization. Inflation will continue to decrease with stabilization, suggesting that stabilization may be a necessary but insufficient condition for growth. Furthermore, short-term inflation determinants and growth illustrate the key roles of fixed exchange rates, improved fiscal balances, and structural reforms in increasing growth and lowering inflation. This research suggests that inflation-stabilization programs have been beneficial for growth even after controlling for structural reforms. Controlling high inflation is a precondition for the revival of growth.

If wages increase, then employers may raise prices to cover increased costs. Should this occur on an aggregate level in the economy, wage growth will lead to inflation.
GDP Per Capita

GDP per capita measures economic production. Empirical literature identifies GDP per-capita differences between origin and destination countries as a key determinant of migration between nations. Migration may affect growth through (1) an increase in the destination country’s GDP per capita, (2) an increase in the income gap between countries, (3) a decrease in the net migration rates from the origin country, or (4) the net immigration to destination countries. Hatton and Williamson (2005b) show the nonlinear relationship between development stages and migration flows. If development stages are measured by GDP per capita, then the GDP per-capita differentials and migration may not be collinear. Conversely, when a given level of development is attained in the origin country, the migration flows into the destination country are reduced. Gilpin et al. (2006) purport that including GDP per capita and a measure for unemployment should account for the push factors of the origin country and the pull factors of the destination country.

While GDP per capita is used as a standard proxy for wage differentials (World Bank 2006), Dustmann and Fabbri (2003) suggest that per-capita economic growth following migration does not vary either way. Bauer and Zimmermann (1999) evidence mixed results on the importance of per-capita income spreads between countries. Greenwood (1975), Venti and Wise (1984), and Barro and Sala-i-Martin (1992a) each indicate that wage differentials do not have a large impact on migration patterns. Several German studies find only small wage effects, even when there is a large immigration influx (Pischke and Velling 1994; Bauer 1998; Winter-Ebmer and Zimmermann 1998).

Additionally, as an economic tool, GDP per capita has certain shortcomings. While an increase in average incomes may be associated with an increase in income distribution,
GDP per capita provides no information about income distribution. Moreover, it is not evident whether GDP per capita increases because of immigration, although a cursory overview of the literature suggests that if immigrants have higher labor-market participation and lower unemployment rates than natives, there is a small positive impact on GDP from immigration.

An increase in GDP per capita is driven by growth in labor productivity and labor use that triggers structural adjustments to prevent surges in inflation due to enhanced purchasing power. Increased values of real per-capita income suggest that the potential exists for higher real incomes for migrants from lower-income origin countries. An increase in GDP per capita creates an increase in standard of living through higher consumption levels and gives migrants the power to invest in other factors that improve quality of life. For the destination country, economic growth indicates that the impact of migration on the income growth of natives depends on the human-capital levels of immigrants. However, on average, immigrants tend to have lower labor-market participation rates than native workers. Immigrants with little human capital impede per-capita growth, while immigrants with high levels of human capital accelerate per-capita growth. Detailed discussions of this issue are presented in Barro and Sala-i-Martin (1995), Friedberg and Hunt (1995), and Rothgang and Schmidt (2003). However, Biffl (1996) suggests that if immigrants enter with low skills, their entry may not necessarily translate to positive GDP per-capita growth because they may not contribute to the economy.

In the short run, the law of diminishing returns to labor occurs when the marginal product of labor begins to fall. The total output continues to rise, but it will increase at a decreasing rate as more workers enter the labor force. Since there is a gap between
available employment and the skills needed to perform these jobs, labor migration may reduce the shortages. Classical economists, such as Malthus, West, and Ricardo, apply the concept of diminishing marginal productivity to land, as if the use of labor rather than land is no different from the original law. Thus marginal product is linked directly to the productivity of each extra worker employed. Under a shortage of labor input, the marginal product is higher than when there is too much labor. At low levels of labor input, the fixed factors of production are underused: each additional worker will have plenty of capital to use and marginal productivity may rise as a result. However, beyond a certain point, the fixed factors of production are in short supply. New workers will not have as much capital to work with, thereby weakening the capital input of the larger workforce. Additionally, the law of diminishing marginal productivity of labor is that total marginal output decreases with the addition of each extra worker to a task. The increase in total output is not in direct proportion to the output of an individual worker.

In countries with relatively more capital than labor, the marginal productivity of capital improves because of immigration while labor cost is reduced to make the country’s products more competitive. The productivity of workers is diminished due to labor shortages in destination countries and the lack of a possible critical and skilled labor force. With an increase in migration inflow for the destination country, parity will eventually be reached in which the additional yield becomes progressively smaller. Lucas (1988) suggests that migration may not reduce the wage gaps between origin and destination countries because of technological and institutional differences. Rather, Lucas (1988) describes the human capital externalities that capture an imperfect substitution among workers with different levels of human capital, such that there is a wage gap
between areas with migration increases. Grossman (1982) shows that the short-term elasticity of employment substitution causes a decrease of a few tenths of a percentage in native employment. Conversely, long-term wage elasticity suggests that an increase in immigration reduces native wages. However, Rosenzweig (2007) and Clemens, Montenegro, and Pritchett (2009) suggest that the differences in GDP per capita may inflate any income gains. Boeri and Brücker (2005) contend that an increase in CEE migration to the EU may increase differences in wages and productivity and subsequently strengthen the EU GDP, if sustained.

The positive relationship between GDP per capita and wages suggests that migration favors convergence. The economic convergence–divergence debate has its genesis in the neoclassical Solow-Swan model (Solow 1956; Swan 1956), with a refined framework by Barro and Sala-i-Martin (1992a, 1995), who use a neoclassical production function to investigate the effect of per-capita income on migration. Furthermore, Mankiw, Romer, and Weil (1992) develop a human-capital–augmented neoclassical growth model, adding a measure of school enrollment, and Borjas (1994) offers that fast-growing economies should lower emigration pressure. An overview on convergence is discussed in Barro and Sala-i-Martin (1995). While the literature discusses the extent and speed of convergence deeply, this dissertation does not address this topic, as that discussion is beyond its scope.

With a more detailed discussion on the empirical research on convergence, Blanchard and Katz (1992) and Dolado, Goria, and Ichino (1993) contest Barro and Sala-i-Martin (1992b), suggesting that migration is negatively related to regional convergence. Moreover, Friedberg and Hunt (1995) suggest there are conflicting results on the causal
connection between migration and economic growth. Dowrick and Nguyen (1989) and Gundlach (1993) discuss convergence across OECD countries; Barro and Sala-i-Martin (1992a, 1992b, and 1995) discuss convergence across the United States, European regions, and Japanese prefectures; Bajpai and Sachs (1995) discuss convergence across Indian states; Gundlach (1996) and Jian, Sachs, and Warner (1996) discuss convergence across China; and Zini and Sachs (1996) discuss convergence across Brazilian states. Finally, Sinn (1999) discusses wage convergence after German reunification that resulted in the rapid rise of wages in the East and fewer job opportunities in the West after 1992 (which may explain the relatively low migration rates). Conversely, for a discussion on divergence and migration represented by growth models, see Magrini (1999), Boldrin and Canova (2001), and Cuadrado-Roura (2001). For discussions pertaining to the CEE countries, see Puga (2002); to Hungary, see Fazekas (1996); to Poland, see Gorzelak (1996); and to Bulgaria, see Totev and Sariiski (2008).

Wages

Friedberg and Hunt (1995) divide the wage-and-migration literature into three major approaches: (1) cross-country differentials (Sjaastad 1962), (2) natural experiments independent of local labor-market developments (Card 1990; Altonji and Card 1991; LaLonde and Topel 1996), and (3) studies estimating the effects of migration on relative wages for different skill groups (Borjas et al. 1997; Jaeger 1996). The factor-proportion approach uses actual wage changes on the national level and compares them to a counterfactual estimation. Area analysis, the measurement of immigration’s impact on the wages of native workers, was the primary methodology but may not adequately
address mitigating changes in local labor markets. Borjas (2003) purports that the low-wage effects in the migration literature are due to methodological problems.

Most studies in the literature show few or no effects of immigration on native wages and unemployment levels (see, for example, Longhi, Nijkamp, and Poot 2005, 2006). A notable exception is Borjas (2003), illustrating how national data are used to make comparisons across occupations, education levels, and years of experience, to measure the impact of immigration on native wages. Borjas (2003) reports a negative impact of Mexican immigrants on low-skilled US workers’ wages. In contrast, Peri (2006) suggests that national-level estimates yield both positive and negative effects of immigration on native workers’ wages, potentially ignoring changes in the overall labor market that occur because of immigration pressures. Tamura (2007) focuses on the perceived labor-market impact of immigration, examining differences between employers and employees in the preference for immigration in the destination country. Employers are more likely to support immigration than employees when immigrants are anticipated to compete with labor suppliers rather than employers in the destination country. However, employers are more likely to prefer little or no immigration than employees are when immigrants are expected to compete with employers rather than employees in the host country.

Migration from the origin country can either raise wages or lower unemployment in the origin country, with positive labor-market implications. Cohn (2001) argues that the influx of immigrants lowers the wage rate by increasing the supply of workers applying for jobs in the short run. In the long run, however, wages will fall only if the amounts of other resources do not change. Scheve and Slaughter (2001) conclude that
while income depends on individual skill levels, there may be a significant causal link between skills, wages, and immigration policy. Some research has shown inconclusive results, with immigrants having little or no impact on native EU labor-market conditions (Friedberg and Hunt 1995; Longhi, Nijkamp, and Poot 2009). De Rugy and Tapinos (1994) point out that the reason for the relatively small impact on native workers’ wages may be because illegal immigrants do not compete with natives, since illegal immigrants typically take lower-paying jobs. In their discussion on wage flexibility, Münz et al. (2006) suggest there is some evidence that an increase in the labor supply decreases wages for workers with the same educational levels. Galor and Stark (1991) present evidence that immigrants do better than natives when the two populations have identical observable characteristics. However, an increase in labor supply may also imply new investment opportunities that counteract lower wages.

Some studies on migration and wages adopt an equilibrium approach, whereby economic differentials are considered equalizing. Change in the labor supply may minimize the impact of migration on native wages and employment, spreading negative effects throughout the labor market. If the labor demand curve is perfectly elastic, labor inflow should lead to higher wages or lower unemployment for native workers in markets where skills are complementary, and have a negative impact on natives whose skills are substitutes. While these flows may be large, the two-way movement keeps aggregate net migration low. For two countries at different levels of development, differences in the average wage reflect differences in the same direction for many occupational and skill groups, spurring net migration flow from the low- to high-income country. Greenwood (1985) stipulates that labor demand is a function of the ratio of immigrants to native wage
rates and the institutional factors of the destination country. For two countries at the same level of development, the differences in wages arising from occupation-specific labor-market differences impel migration in either direction. However, Borjas et al. (1997) argue that the immigration impact on wage and employment is understated in the literature because of factor-price equalization, which stipulates that the prices of goods, and, by extension, capital and labor, are equalized between countries moving toward free trade.

Immigration is considered a positive shock on the labor market, with the wage effect dependent on the labor-supply curve. Equilibrium wages will decrease and employment will increase by less than the immigration influx, displacing natives. Borjas et al. (1997), Borjas (2003, 2006), and Orrenius and Zavodny (2006) discuss negative wage effects (i.e., the decline in wages caused by market disequilibrium in excess of any labor demands). For additional discussions on the negative wage effects of migration, see, for example, Boeri and Brücker (2001) for Austria, Hofer and Huber (2003) for Austria, and Reed and Latorre (2009) for the United Kingdom. For Germany, DeNew and Zimmermann (1994) find that unskilled wages fell because of immigration in the 1980s, but that wages of skilled workers increased. Moreover, for the United Kingdom, Dustmann, Frattini, and Preston (2007) find that immigration had different effects along the distribution of wages for native workers, lowering wages for the bottom 20 percent but leading to a slight increase for the upper part of the wage distribution.

Mayr (2005) demonstrates low-skilled migrants have difficulty in labor markets with high unemployment protection, high minimum wages, and high-skill demand. Countries characterized as strong welfare states with low wage-inequality levels tend to
attract low-skilled immigrants. Kogan (2006) further offers that migration integration in the destination nation is likely to require high degrees of social mobility and flexible markets. Ben-Gad (2004) suggests that skill levels have different effects on factor returns and on welfare implications for various population sectors. For the United Kingdom, Nickell and Saleheen (2008) find that once occupational status is incorporated into a regional analysis of immigration, the immigrant–native ratio has a significant negative impact on wages in the semi- and unskilled service sectors.

Expectations of future income play an important role in migration decisions: if the income gap declines, the incentive to migrate is mitigated. Belot and Hatton (2008), Ortega and Peri (2009), and Grogger and Hanson (2011) use countrywide average-income data to represent migrants’ expected incomes in destination countries. Ortega and Peri (2009) find that immigrant inflow does not tend to reduce capital intensity or factor productivity in either the short or long run. Immigration increases the total GDP in the short run without affecting average wages or average per-capita income. However, Mayda (2010) suggests that while total GDP increases in the destination country, the increase in the GDP per capita is not statistically significant. Yet, none of the aforementioned factors control for selection, nor do they estimate counterfactual incomes that potential migrants could earn at their destination or origin. Only Clemens et al. (2009) address this issue by calculating the wages of identical workers with the same nationalities across countries. However, they do not estimate a migration-decision equation.

Migration may affect aggregate income through its effects on native workers’ employment and wages (Borjas 2003; Ottaviano, Peri, and Wright 2010; Chassamboulli and Palivos 2010; Ottaviano and Peri 2011).
Net migration may be positively related to average wage and negatively related to the unemployment rate in the destination country. Hunt (1992) and Friedberg (2000) suggest that even with large migration, an increase in labor supply may not reduce native wages or cause unemployment. Gould (1979) and Greenwood (1985) show that migration is positively related to regional differences in wages and per-capita income, with the migration process characterized by lags. Migration may also affect the destination economy’s industrial and occupational composition (Farré, González, and Ortega 2009; Peri and Sparber 2009; Cortés and Tessada 2010; Dustmann, Frattini, and Halls 2010). For Russian migration to Israel, Friedberg (2000) finds that occupations employing more immigrants have slower wage growth. In their research on East–West migration between Germany and the EU, Alecke et al. (2001) propose income differentials drive migration flow in German states. Bonin et al. (2008) suggest not only an increase in the labor market, but also an increase in earning potential. However, if immigration does have an effect on native labor-market outcomes, it is likely to be relatively small (Friedberg and Hunt 1995; Smith and Edmonston 1997) or concentrated in certain segments of the labor-supply curve (Borjas 2003). Additionally, labor-market adjustments may include native internal emigration, with an adverse impact on wage and employment, such that natives see upward mobility and immigrants remain on the lower end of the socioeconomic spectrum. Immigrants not remaining in the destination country invest less in human capital, potentially having lower wages and higher unemployment. Nathan (2008) suggests that low-level results may mask differences in the distribution of gains and losses for particular groups among the native-born population and across different regions of the country.
In contrast with the evidence for adverse effects on native workers, Bartik (1991) suggest that migration’s impact on net wages may be complex and difficult to substantiate. Ghatak et al. (1996) show that migration does not automatically occur because of wage differentials. Rather, a greater wage gap between destination and origin regions increases migration only if potential migrants do not face borrowing and other financial constraints. If wages increase in response to an increase in labor demand and decrease as the demand for labor decreases, it may be difficult to differentiate between a change in wages and a change in employment availability. Thus, Greenwood (1975) suggests that estimating the impact of migration on net wage, separate from employment availability, depends on the model’s causality assumptions. With the exception of a few outliers, an increase in the labor force from migration yields a similar percentage change in native wages. Lemos and Portes (2008) find little evidence to support the assertion that the inflow of accession migrants contributed to lower wages or increases in United Kingdom unemployment claims in 2004 and 2006. This is in keeping with the literature on the impact of migration in the United States evidencing little or no effect on employment and wages.

Unemployment

Literature exists that attempts to estimate the elasticity of substitution, in the context of labor demand and in production functions. Borts and Stein (1964) confirm that changes in employment are caused by differential rates of immigration, assuming labor demand is perfectly elastic. Any increase in labor supply from migration stimulates increased investment in the destination country, causing an increase in labor demand and in wages. Muth (1970) refines Borts and Stein, treating migration and employment as
exogenous factors, and suggests that product and labor demand can be perfectly elastic, such that net immigration leads to a direct increase in employment. The employment increase is proportional to the labor migration. Employment growth leads to migration, more so in workers between the ages of twenty-five and fifty-four, because this group has a higher rate of labor-force participation.

Migration also affects labor use through labor-force participation and unemployment rates. However, immigrants are viewed as either (1) decreasing employment opportunities for the native population or (2) doing jobs the native population is not willing to do and, by extension, not taking jobs away from the native population. Unemployment rates may not be considered in the labor-migration decision because the unemployed are a small subset of the labor force and an even smaller subset of the population. Lansing and Mueller (1967) also suggest that unemployment tends to be higher in less-mobile groups in the labor force. Greenwood (1975) further offers that higher unemployment rates are of the most concern to the unemployed. Todaro (1969), Bowles (1970), and Straubhaar (1988) suggest that changes in wages and unemployment associated with economic cycles affect the optimal timing of migration, influencing rates of return in the short run. Thus, wages are inversely related to unemployment. Even when the impact of unemployment and wages on net migration is statistically significant, it is very small. Moreover, Marr and Siklos (1994) and Pope and Withers (1993) find that migrants to Canada and Australia do not increase unemployment in either country. However, if unemployment increases, the impact relies on wage flexibility, substitution, or the complementary nature of native and immigrant workers.
Indicators of immigrant success in the labor markets of destination countries include their relative employment and wage rates compared to native workers.

Greenwood (1981) and Mueller (1982) recognize that migration allows the labor supply and demand to equilibrate from regions where employment is scarce to regions where employment is available. Siebert (2001) finds that neither income nor unemployment differential, but rather the employment gap and the expected income gaps, drive migration. According to Card (2001), understanding the native–immigrant dynamic is essential to identifying the effect of migration on wages and employment. The empirical research on migration, employment opportunities, and growth focuses not only on the causes and consequences of migration, but also on the responses to employment shocks. The European literature tends to focus on assimilation as a proxy for employment or on the displacement effect on the destination labor market. However, Hunt (1992), Winkelmann and Zimmermann (1993), DeNew and Zimmermann (1994), Mühleisen and Zimmermann (1994), and Winkelmann (1999) find little evidence of adverse employment effects. This demonstrates that employment rates for immigrants with different skill levels may vary, but they tend to converge with native employment rates for similarly skilled groups.

Gordon (1985), Pissarides and McMaster (1990), and Hunt (2000) conclude that migration will gradually reduce unemployment differentials. Where wages are less flexible, unemployment is higher. Fidrmuc (2004) study transition economies, showing that migration is not likely to reduce wage and unemployment differentials, concluding that high wages seem to encourage migration. Coppel et al. (2001) argue that migration may cause small net gains for the destination country, but benefits may not be distributed
evenly (with migrants receiving the worst of the distribution). Kallai and Traistaru (2001) report a significant impact of unemployment rates on wages for Romania, while Duffy and Walsh (2001)—using both Polish regional and individual data—find wage levels to be elastic with respect to regional unemployment rates. Huber (2004) finds that elasticity with respect to regional unemployment rates is slightly higher in EU candidate countries than in the EU, where the elasticity of national unemployment rates is lower. Kertesi and Köllö (1997, 2001) find a significant negative impact of unemployment levels on regional wages, suggesting that elasticity increases in transition. However, Hughes and McCormick (1994) evidence that net migrations and outflows are influenced by regional labor markets. This suggests that relative wages, not unemployment rates, are effective in reallocating labor.

Borjas (1990, 1994) and LaLonde and Topel (1996) purport that immigration does not have a significant effect on employment or native wages in the same labor-market segment, even where immigrant supply is large. The country studies of Pischke and Velling (1994, 1997) for Germany; Zorlu and Hartog (2005) for the Netherlands; and Carrasco, Jimeno, and Ortega (2008) for Spain indicate little or no evidence of native wage reductions. For the United Kingdom, Kirby, Mitchell, and Riley (2008) find inconclusive evidence when studying net fiscal migration impact. Ortega and Peri (2009) find that immigration increases employment, with no evidence of crowding out destination natives. Angrist and Kugler (2003) suggest that rigidities in the European labor market exacerbate the negative impact of immigration on native employment. Similarly, Dustmann and Glitz (2005) and Gordon, Travers, and Whitehead (2007) both
suggest that increases in the labor supply have negative concentrated effects, especially at the low-skilled end of the market.

While migration may show a short-term negative impact on the unemployment rate of native workers, there is literature that suggests the effects are negligible at best (see Vedder, Galloway, and Moore 1994, as quoted in Anderson, 2010). Because immigration may involve small population movements, it may not be possible for migration to explain differences in unemployment. Gang, Rivera-Batiz, and Yun (2002) find little or no association between the presence of immigrants and unemployment among natives. The exception is for the less-educated native workers who suffer from higher unemployment rates, but only in the presence of a substantial number of immigrants. Greenwood (1975) and Pissarides and Wadsworth (1989) point out that some of the early unemployment empirical literature yielded unanticipated signs or insignificant coefficients on the unemployment rate. Commander, McHale, and Yeemtsov (1995) report ambiguous results for the Czech Republic, Hungary, Poland, and Slovakia. This may be due, in part, to simultaneous equation bias, an inconsistent model estimate composed of two or more simultaneous explanatory relationships. Hunt (1992), Winkelmann and Zimmermann (1993), DeNew and Zimmermann (1994), Mühleisen and Zimmermann (1994), Winter-Ebmer and Zweimüller (1994), and Zimmermann (1995) find that migration has small negative, but inconclusive, effects on unemployment in European labor markets. Boeri and Scarpetta (1996) find negative but insignificant parameters when estimating the effect of regional wage changes on changes in unemployment rates.
Alba and Nee (2003) put forth that migrants who have higher unemployment levels, lower-quality jobs, and lower earnings compared to their native counterparts may be at an economic disadvantage. Winkelmann (1999) agrees with Poot, Nana, and Philpott (1988), finding male immigrants from the United Kingdom in Australia had similar employment outcomes as natives, as they faced lower barriers to employment entry. These gaps diminish over time, but the convergence process is slow. Greenwood, McDowell, Waldman, and Zahniser (1999) suggest that there is a small substitution effect between native and immigrant workers in the unskilled category only. Studies by Butcher and Card (1991) and Wright, Ellis, and Reibel (1997) on the impact of immigrants and the labor force in US metropolitan areas reject the hypothesis that substitution exists between internal and international migrations. Likewise, according to Borjas (1990), substitution does not exist between immigrants and the native labor force. Borjas (1994), Bauer and Zimmermann (1999), and Longhi, Nijkamp, and Poot (2009) argue that the effect of migration on the labor market depends on whether immigrants substitute or complement native workers. They conclude that unskilled migrants can substitute for natives, whereas skilled migrants may complement skilled natives. This suggests that wages of natives tend to increase through the migration of workers with higher skill levels. Altonji and Card (1991) find a small positive effect, suggesting that the two types of workers are complements rather than substitutes. McConnell, Brue, and D. A. Macpherson (2003) add that displacement is less likely than in the total employment of legal immigrants. Welch (1979), Katz and Murphy (1992), Card and Lemieux (2001), and Borjas (2003) conclude that different levels of work experience are considered imperfect substitutes for native workers. Borjas (2003) disaggregates the imperfect
substitute by experience and education, while assuming perfect substitution of native and immigrant workers in each group. Ottaviano and Peri (2005, 2011) allow for imperfect substitution in the labor market between native and immigrant workers by education and experience level. Whereas Borjas (2003) assumes that perfect substitution can occur, Ottaviano and Peri (2005, 2011) argue that natives and immigrants are complements, thereby making adverse wage effects less likely. Boucher (2008), for example, suggests that where substitution is low, productivity increases may be significant if there are improved prospects (i.e., potential migrants invest in education with the expectation of better possibilities in migration). As there exists heterogeneity in labor markets, Borjas, Grogger, and Hanson (2011) counter Ottaviano and Peri (2005, 2011): the finding of imperfect substitution disappears once the analysis is adjusted for heterogeneity. Findings of immigrant–native complementarity disappear by removing a variable from the data.

Discouraged Workers

Nonparticipation in the labor force reflects what economists term either long-term unemployment or hidden unemployment. As defined by the International Labour Organization (ILO), a discouraged worker denotes an unemployed worker not actively seeking employment. These are individuals who are available for employment, have looked for employment, but may no longer be seeking employment because they believe no jobs are available. Much of the empirical literature does not consider this unemployed segment, which offers a misleading portrayal of the labor market. As individuals who are willing and able to work but who have discontinued their search because of limited job prospects, discouraged workers are a subset of the unemployed (Humphrey 1940; Woytinsky 1940; Isserman et al. 1986; Buss and Redburn 1988). A prima facie case
exists for including discouraged job seekers in official unemployment data, but many developed countries do not use this measure. Beyond a universal definition and implementation problem, Flaim (1973) notes this is a subjective measurement garnered from surveys that may lead to biased outcomes. At best, the discouraged-worker concept can be described as ambiguous, making it difficult to capture and measure with adequate labor absorption. Additional research is required on discouraged workers’ likelihood of entering the labor force, whether their activities included any employment searches, and their availability and willingness to work.

Denniss (2003) suggests that labor-market statistics are outdated, as they were created during a time of near-perfect employment and a male-dominated labor force. Additionally, Stricker and Sheehan (1981) suggest that official unemployment rates ignore underemployment (people who are working part time but wish to work full time and those who have accepted jobs below their abilities) and hidden unemployment (discouraged workers). Clark and Summers (1979) stipulate that the discouraged worker may be considered an immediate reserve for the labor force. Eamets (2004) looks at annual changes in employment, unemployment, and inactivity in the late 1990s, finding some evidence for the discouraged worker effect in Latvia and Lithuania, but not in Estonia.

Migration Policy

Prevalent in the literature, the study of immigration laws’ effects on migration for both origin and destination countries tends to focus on economic and demographic factors. Yet, investigating the exact role of migration policy on migration is clearly limited, due in part to the difficulty of operationalizing policy and the lack of a universal
understanding. Ortega and Peri (2009); Beine et al. (2011); and Grogger and Hanson (2011) provide an econometric analysis of the aggregate data. In each, the migration decision is consistent with the individual-level migration decision, whereas the work of Clark et al. (2007); Pedersen, Pytliková, and Smith (2008); Mayda (2010); and Theoharides, McKenzie, and Yang (2010) is not based specifically on the individual-level decision. Bertocchi and Strozzi (2008) discuss the economic and demographic determinants of citizenship laws. Clearly, a country’s macroeconomic stability plays an important role in shaping migration policies. Sjaastad (1962) explains that the main labor-market explanatory variable for immigrant workers is the absolute difference in wages between the destination and origin countries. In contrast, it is the ratio of immigrants to native wages for demand. During periods of economic distress, there is a tendency to move toward immigration restriction, whereas economic booms are associated with expansive policies. Timmer and Williamson (1998), for example, suggest that wage inequality, more than unemployment or absolute wage levels, may trigger restrictive policies.

Yet, Sinn (2001) puts forth that East–West migration cannot be explained solely by economic arguments. Migration has been and continues to be an important component of life in CEE countries; it not only shapes the European labor market, but is dependent on the acceptance of immigrants in the destination country. Even with EU countries’ migration restrictions—including quotas and occupational preferences, all in place to avoid permanent residence at the destination country—there continues a westward movement, especially from the CEE accession countries (United Nations World Migration Report 2006). Evidence exists in the literature to suggest that while
immigration policies, either restrictive or expansive, do have some effect on migration flows, the overall effects seem to be small when compared to other types of migration determinants, as discussed in Castles (2004), Thielemann (2004), Mayda (2010), and De Haas (2011). Clearly migration policies are important factors for migration, but they are not the primary factors to explain any change in migration flows or the individual decision to migrate. As Pedersen et al. (2008) and Berthélemy, Beuran, and Maurel (2009) put forth, migration flows are affected not only by migration policies, but also by other policies related to welfare systems, education, macroeconomic, and labor-market policies.

Many western European nationals have been less positive about mobility from the CEE region, exemplified by the rise in anti-immigrant sentiments and fears about an influx of cheap labor displacing native workers. Public discourse on, and opinions of, immigration consider the economic and political climate of the destination country, as discussed in Bauer and Zimmermann (2000), O’Rourke and Sinnott (2003), and Mayda (2006). Greenaway and Nelson (2006, 25) conclude “public politics of … immigration is local and essentially social.”

Any influx of unskilled immigrants is viewed as a burden to the destination country’s welfare system. There is a developed body of literature analyzing how different welfare systems affect migration rates, skill composition, and differences in native and immigrant reliance on the welfare system (Schierup, Hansen, and Castles 2006; Nannestad 2007; Barrett and McCarthy 2008; Warin and Svaton 2008). Cohen and Razin (2008) find welfare benefits tend to attract lower-skilled immigrants. When immigration is controlled, educational levels of immigrants tend to be higher. High-skilled immigrants
tend to be net contributors to the welfare infrastructure, thereby financing a more
generous welfare system. The low-skilled labor flow may lower wages and welfare
components at the lower end of the destination labor supply. Furthermore, Schmidley
(2001) suggests that the labor market may be further segmented as native workers may
not take available jobs. These individuals are likely to be engaged in unstable, low-
paying jobs because of low or discounted skills and therefore have low income.
CHAPTER IV

METHODOLOGY

Introduction

Hendricks (1997, ii) offers that migration data “provides an opportunity to learn not only about the economic forces underlying migration, but also about the nature of human capital.” In the literature, there is a presumption that migration is influenced by economic factors, in particular unemployment rates and wages. Fidrmuc (2004) suggests that if migration (as represented by capital mobility) is the principal construct for absorbing adverse effects of asymmetric shocks, then a response is an increase to unemployment and a corresponding decrease in wages. This suggests that individuals will move to, and seek employment in, destination countries with higher wages and better employment opportunities.

The current analysis examines the impact of labor migration from the CEE region (specifically the A10 countries, which are Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia) on the nations of the United Kingdom, Ireland, France, Germany, Denmark, and Sweden. The current analysis covers the transition and accession years; that is to say, the period between 1989 and 2010.

Measuring migration is necessary as it estimates the size and growth of a population, monitors changes in the number and characteristics of migrants, and provides information on inflows and outflows of people. Thus, to understand the economic rationale for the interaction of migration determinants is to understand the composition and characteristics of the migratory process, which in turn provides a necessary structure in evaluating the impacts on origin and destination economies. For the purposes of this
dissertation, the unit of analysis is country as put forth by Borjas and Katz (2007) and Ottaviano and Peri (2008).

This chapter is organized as follows: (1) conceptual considerations; (2) analytical considerations: (3) an examination of data sources; (4) variables and their expected impact; and (5) research questions and hypotheses on the determinants of international migration, organized relative to each other.

Conceptual Considerations

Gravity Model

A prevailing empirical method in migration research is the use of a gravity model to study economically based international migration. The gravity model emphasizes that migration occurs between countries based on population size and the distance between countries, as first presented in Ravenstein (1885, 1889). Tinbergen (1962), Pöjhönen (1963) and Linnenmann (1966) were among the first to use the gravity model to explain countries’ bilateral trade flows, a practice that has been subsequently adopted by such noted researchers as Anderson and van Wincoop (2003), Chaney (2008), and Ortega and Peri (2009). Adapting from the bilateral trade discussions of Tinbergen (1962), Pöjhönen (1963) and Linnenmann (1966), Young (1975) uses the gravity model to express migration as a function of distance, whereas both Smith and Clayton (1978) and Smith and Slater (1981) view migration in terms of informational flows. In contrast, Cheng and Wall (2005) suggest that the gravity model is sensitive to the choice of the data structure.

As this dissertation examines select components of the gravity model (GDP per capita, unemployment, wages, and emigration outflow), a modified version of the pseudogravity model investigating international migration as discussed in Karemera et al.
(2000), Pedersen et al. (2004), and Clark et al. (2007) will be used. That is to say, elements of the gravity model were adopted for the current investigation. For example, in the literature, the prevailing methodology adopts an equilibrium approach that allows for a two-country context, expressed as the annual rate of net migration. In other words, migration flow is a response of homogeneous individuals reacting in the same way to changes in migration determinants. However, the nature of the data for this dissertation does not allow for that type of construction. As there are multiple origin and destination countries, only one side of the gravity model, the pull side, can be analyzed. There is a presumption in this dissertation that the push factors are negative economic conditions in the origin countries and are present in the A8 and A2 countries during the years 1989 to 2010.

Analytic Considerations

The dissertation’s analytical framework is based in part on the work of Hatton (1995), which has its genesis in what Sjaastad (1962) refers to as human-capital investment. Sjaastad measures the costs and benefits related to migration as a rate of return on the investment people make when they decide to migrate, which (it is hoped on the part of the people who migrate) will yield future returns. Such investments by individuals are subject to depreciation in physical and economic perspectives. Also, neutral productivity growth in an economy increases migration flows from low-income to high-income countries. If productivity growth is the result of innovations that create new products and changed processes, neutral productivity would suggest that employment rises in tradable sectors and falls in nontradable sectors, as discussed in Batabyal and Nijkamp (2009). Hicks (1932) suggests that any technological change does not change
the ratio of capital marginal product to labor marginal product for a given capital–labor ratio. Referring to the behavior of technological change in models, there are two other main types of neutral technological progress, Harrod-neutral and Solow-neutral. Harrod-neutral suggests that if technology augments labor, it may increase the efficiency of labor. While it can stimulate economic growth, it may also cause unemployment, as certain skill levels may become redundant. If it is Solow-neutral, then technology augments capital.

Emigration, or at least the decision to migrate, may be viewed within the context of both institutional and labor-market constraints. There is empirical evidence, across different data sets suggesting that migration is positively related to differences in both wages and per capita income, as discussed in Gould (1979) and Greenwood (1985), for example. While migration seems to be responsive to regional differences in unemployment, Hatton’s (1995), Hatton and Williamson’s (1994, 1998), and Massey’s (2000) models use wages and unemployment rates as part of an explanatory framework to find that both contribute to explaining migration rates. Results indicate that emigration usually increased as wage rates in origin and destination countries converged. A decrease in wage differentials are outweighed by immigrants to the labor market, increasing income as structural shift from agricultural labor. Thus, the authors argue that migration rate is a function of relative wages and relative unemployment rates in destination and origin countries, as well as the existing stock of migrants. In their model, dependency on prior migrant stock is assumed but not required for a migrant network. The effect of uncertainty in the migration decision, and the formation of expectations about future income is based on past information. It is important to note that Hatton’s (1995) model and its treatments in Hatton and Williamson (1994, 1998), Clark et al. (2002), Fertig and
Schmidt (2002), Mitchell and Pain (2003), and Zaiceva (2004) are based on permanent migration, whereas much of CEE migration is temporary. Moreover, Hatton (1995) explicitly incorporates uncertainty into the migration decision and accounts for the formation of expectations about future income streams based on past information. Although important to mention here, it should be noted that a dynamic model that integrates return migration is beyond the scope of this dissertation.

Most evidence concerning the reaction of wages to regional unemployment rates in countries in transition has been based on competing approaches. One approach is a wage–unemployment function, which, as Blanchflower and Oswald (1994) note, can be expressed as an inverse relationship. Another approach is a longitudinal variance in the data which leads to a relationship between the rate of wage growth and unemployment, as discussed in Baddeley, Martin, and Tyler (2000). Finally, any connection between wages and unemployment would suggest wage flexibility in the destination country (see, for example, discussions by Golinelli and Orsi (2001) for Hungary and Poland, Welfe and Majsterek (2002) for Poland, and Bornhorst and Commander (2004) for Russia, Romania, and Bulgaria).

Data Sources

The data used for this dissertation were drawn from published, historical-migration statistical information that was extracted primarily from EuroStat, OECD and its affiliated networks, the Continuous Reporting System on Migration (SOPEMi), the International Dialogue on Migration database, and the ILO. As needed, supplemental data were extracted from the Centre d’Etudes Prospectives et d’Informations Internationales

EuroStat is widely considered to be the leading statistical office of the EU in providing quality statistics about Europe as a whole and individual European countries. EuroStat recognizes that societies cannot function without a solid basis of reliable and objective statistics, and that statistics are needed and necessary to give an accurate and evaluative picture of contemporary society. OECD is similar in form and function to EuroStat. The mission of OECD is to work with governments of various European countries to understand what drives economic, social, and environmental change by measuring productivity and global flows. SOPEMi covers most OECD member countries, the Baltic States, Bulgaria, and Romania. However, SOPEMi has no authority to impose changes in data-collection procedures but rather is an observatory which, by its very nature, has to use existing statistics. Nevertheless, it does play an active role in suggesting what it considers to be essential improvements in data collection and makes effort to present consistent and well-documented statistics. Along these same lines, the aims of the ILO are to promote rights at work, encourage decent employment opportunities, enhance social protection, and strengthen dialogue on work-related issues. The structure of the ILO is to provide a unique platform for promoting rights at work, encourage decent employment opportunities, enhance social protection, and strengthen dialogue on work-related issues.

In addition to these primary data sources is the CEPII. Founded in 1978 and affiliated with the Centre d’Analyse Stratégique, CEPII expertise is as a research center in international economics. Similarly, the UNPD plays an active role in the
intergovernmental dialogue on population and development, producing constantly
updated demographic estimates and projections for all countries. The UNPD assists the
Department of Economic and Social Affairs in discharging its functions as A member of
the Global Migration Group. It collects statistics on international migration flows and on
the stock of migrant populations. Furthermore, it provides programmatic support to the
Special Representative of the Secretary-General for International Migration and
Development. It co-chairs the Population cluster of the Executive Committee on
Economic and Social Affairs, together with the Population Division of Economic
Commission for Latin America and the Caribbean. The World Bank is a source of
financial and technical assistance to developing countries, with the sole purpose of
reduction of poverty. Finally, IndexMundi is a data portal that captures statistics from
various sources and transforms them into useful and complete country profiles.

Variables Used in the Analyses

**Macroeconomic Variables**

*GDP Per Capita.* GDP per capita is widely used as a validated measure of
socioeconomic-development levels in a given country. GDP per capita is also a measure
of the level of economic development and can be used as a proxy of individual incomes.
The majority of data for GDP per capita was extracted from the OECD. GDP per capita
data for Latvia, Lithuania, Bulgaria, Slovenia, and Romania were not available at OECD,
and were instead extracted from Index Mundi. GDP per capita data from all sources in
the dataset used for this project are pegged to the 2005 US dollar. That is to say, the unit
of measure used for GDP per capita is actual 2005 US dollars.
Using GDP per capita and a measure for unemployment should account for the push factors from the origin country and for pull factors in destination country (Gilpin 2006 et al.). GDP per capita calculated on purchasing-power parity (PPP) is preferable to a fixed rate of exchange, as the exchange rate is reflective of the demand for currencies as a transactional method into a common currency. The PPP conversion allows for national currency aggregates to be compared on the basis of their purchasing power in their respective domestic markets, free from differences in price levels across countries. Thus, all GDP per capita data were adjusted to the level of the 2005 US dollar.

**Wages.** Data for this variable were extracted from the United Nations Economic Commission for Europe (UNECE) statistical database, which itself was compiled from national and international (OECD, EuroStat, Commonwealth of Independent States) official sources. UNECE acknowledges that any official-source segments have methodological differences. However, UNECE took care to either link or rescale these differences when building long consistent time series. Furthermore, the UNECE Secretariat used nominal exchange rates to convert wages to a common currency which is pegged to 2005 US dollars.

The variable, wages, specifically identifies average gross monthly wages for an individual in a given country. This information covers total wages and salaries in cash and in kind, before any tax deduction and before social-security contributions. Variable wages include incomes and salaries, remuneration for time not worked, and bonuses and gratuities paid by the employer to the employee. For most countries, wages covered total economy and are expressed per full-time equivalent employee. This enabled comparison of different countries irrespective of the length of working time and the share of part-time
and full-time workers. For Estonia, wages were measured in cash only, excluding in-kind remuneration, as this was the only data available.

The earnings function in the form of wages is directly associated with the theory of human capital, as well as with the decision to migrate. Fidrmuc (2004) suggests that fixed migration costs may discourage migration at low-wage-level differentials such that average wages will have a U-shaped effect on migration effects. Conversely, destination countries with above-average wages should encourage migration inflows from depressed regions to regions with better economic conditions. Migration may be considered affordable once the origin country’s income reaches a specified income threshold.

Unemployment Rates. The unemployment rate is a good indicator of the extent to which the economy is operating at full capacity. EuroStat defines an unemployed person according to the guidelines set forth by the ILO. In other words, the unemployment rate is the number of people without work as a percentage of the labor force. For purposes of this variable, unemployment will include all men and women aged 15–74 (in the United Kingdom, age 16–74 years) who are without work during the reference week and are available to start work within the next two weeks (or have already found a job to start within the next three months), and who actively sought employment at some time during the last four weeks.

The unemployment rate can be used, and is used, in place of the employment rate. Fidrmuc (2004) suggests that a high unemployment rate and low wages in the origin country should increase the net benefits for migration, such that there is a negative effect for the destination country. Unemployment may also be used as a proxy for job opportunities for the migrant in origin and in destination countries. However, the
unemployment rate does not speak to the type of unemployment present in a given country, which is an important component for policy development.

*Long-Term Unemployment Rates.* Discouraged workers are not considered part of the labor force and are not counted in unemployment rates, thereby creating an incomplete indicator of labor-market performance. Measuring unemployment in transitional economies is not always easy, as it may be difficult to decide who is a “discouraged worker” and who is simply out of the labor force. Combining discouraged workers with long-term unemployment figures gives a more accurate picture of unemployment, as it gives a better measure of the amount of unused and available labor in an economy.

Unfortunately, in the absence of discouraged-worker rate information, the long-term unemployment rate must be used as a proxy for discouraged workers. Long-term unemployment estimates the percentage of total unemployment that is longer than one year in duration. The information on this variable is for both men and women, ranges in age from 15 to 74 (in the United Kingdom, 16 to 74 years), and was extracted from the OECD database.

**Demographic Variables**

*Migrant Stock.* United Nations Statistics defines migrant stock as individuals who have changed their country of residence, usually living at least one year in a destination country. Data for this variable were extracted from OECD, with the unit of measurement for this variable being thousands of migrants. Migrant stock is a measure of information networks provide about employment and other opportunities in the destination country that reduce both pecuniary and nonpecuniary costs, as discussed in both Hatton and
Williamson (2002) and Brücker and Schröder (2006). Information exchange helps in the efficient allocation of labor resources as well as matching of skills with available employment, as discussed in Choldin (1973) and Lomnitz (1976, 1977).

Greenwood (1969, 170) suggests the omission of migrant stock in statistical analyses because its association to prior migration may cause parameter estimates to overstate the variable’s effects. Yet the use of migration stock implies individuals are heterogeneous, reflected in a distribution of net-present-value decisions across individuals. Indeed, the literature is divided on the choice of this variable in statistical analyses, as the underlying assumptions regarding the aggregate migration decisions of individuals often vary. Common practice in the literature is to regress migration flows (e.g., individuals who move to a destination country) on the explanatory variables to assess their strength and effectiveness, as can be seen in Faini and Venturini (1993), Hatton (1995), Boeri and Brücker (2001), Flaig (2001), Hille and Straubhaar (2001), Hatton and Williamson (2002), Pedersen et al. (2004), Brücker and Schröder (2006), and Pytliková (2006). However, this dissertation proposes to use migration stock as an independent predictor, primarily because of its utility as an estimator of migration into a given country.

**Migration Policy.** This variable is used to indicate whether a particular destination country had a policy in place concerning migration. It is also being used as a control for the possibility that immigration into a destination country will be governed by selection based on labor-market needs, as discussed in Meyers (2000) and Kicinger and Saczuk (2004). For example, if migration policies are restrictive in one country, migrants will choose other destinations with liberal policies, as discussed in De Jong and Visser (1997).
Research Questions

Research Question 1: What is the impact of migration on a given destination country’s economic growth (as expressed by GDP per capita) for the six destination countries?

Borjas (1999) estimates that the net short-run impact from immigration is a change in GDP of a few tenths of a percent; for example, Riley and Weale (2006) found that the inflow from the CEE accession countries in the 2004–2005 time span has contributed 0.2 percent to GDP growth to western EU destination countries. Ortega and Peri (2009) suggest that immigration increases the total GDP per capita of the receiving country in the short run, without affecting average wages or labor productivity, even though heterogeneity may occur in the evolution of labor markets when countries are viewed separately rather than as regional aggregates. Pedersen et al. (2004) and Gilpin et al. (2006) found that immigrants from countries with high unemployment rates such as Poland had similar effects for GDP per capita and the unemployment rate in both source and destination countries in their study of migration flows into OECD countries in the 1990s.

Bauer et al. (2004) present evidence that countries that have displayed relatively fast economic growth, such as the Czech Republic, Hungary, Poland, the Slovak Republic, and Slovenia are now experiencing positive net immigration rates. In contrast, countries that grew less rapidly, such as Bulgaria and Romania, have remained emigration countries (Subhan 1998).

On the basis of these points and the previous information put forward in this dissertation, the following hypothesis for Research Question 1 is posed:
\( H_0 \) \textbf{1} \hspace{1em} \text{Destination country GDP per capita will not be affected by migration from the A10 origin countries, net of other factors.}
\[
H_1 \textbf{1} \hspace{1em} \text{Destination country GDP per capita will be positively affected by migration from the A10 origin countries, net of other factors.}
\]

Research Question 2: Does migration create a labor force that enjoys the fruits of its labor in the form of higher wages, or does it generate higher unemployment?

The common notion that immigrants take jobs away from the destination population, thereby increasing unemployment, or that immigrants depress native-population wages is unclear in the current literature, offering mixed results. Although some (Bauer and Zimmermann 1999; Garson et al. 1997; Dustmann and Fabbri 2003; Hatton and Williamson 2003, 2005a, 2005b) have argued that immigration increases unemployment and lowers wages in destination countries, nevertheless, the research on this topic is divided at best. For example, Mishra (2007) building on Borjas (2003) who used the supply shifts in educational levels to assess labor-market impacts of immigration, showed that the impact of emigration operationalized as a negative labor-supply shock (i.e. emigration) on individual wages in an origin country garnered a significant positive effect of emigration and wages. Work by Cohn (2001) Friedberg and Hunt (1995), Longhi et al. (2009) and Scheve and Slaughter (2001) underscore the point that the impact of immigration on wages and unemployment will be negligible in the long run. Indeed, an empirical investigation by the European Commission (2006) found overall little to no conclusive evidence of lasting adverse effects of immigration on unemployment or native wages in western European destination countries; instead, the
report suggested that immigration from CEE countries to western destination countries enhanced wage growth and lowered unemployment.

It is in keeping with economic theory to note that short-run effects are to be expected as an economy readjusts to perturbation, but over the long-run, wages and unemployment return to nominal levels, all things being equal. As previously mentioned, empirical research by the European Commission (2006) found that net migration is positively related to average wage and negatively related to the unemployment rate in the destination country. Hunt (1992) and Friedberg (2001) go so far as to suggest that even with large migration, an increase in labor supply may not reduce native wages or cause unemployment, even if immigration does have an effect on native labor-market outcomes.

Based on the empirical data of the European Commission (2006) and the points made here and at other places throughout this dissertation, the following hypotheses are put forward to investigate Research Question 2:

\[ H_0^2 \text{ Destination country’s unemployment rate will not be affected by migration from A10 origin countries, net of other factors.} \]

\[ H_a^2 \text{ Destination country’s unemployment will be lowered by migration from A10 origin countries, net of other factors.} \]

\[ H_0^3 \text{ Destination country’s wages will not be affected by migration from A10 origin countries, net of other factors.} \]

\[ H_a^3 \text{ Destination country’s wages will be negatively affected by migration from A10 origin countries, net of other factors.} \]
CHAPTER V
RESULTS

Introduction

In terms of migration, the empirical literature to date has put forward two main approaches to estimate the impact of migration on the labor market of destination countries. First, Hanson (2010) suggests the migration literature is characterized by models that estimate bilateral migration flows as a function of characteristics in the origin and destination countries (see for example, Clark et al. 2007). Second, the literature is replete with studies arguing that statistical models should look at the labor-market effects of migration on natives by estimating a model which regresses various markers of economic health (such as GDP per capita, wages, and unemployment) on migration. With respect to the second approach, the share of immigrants in a region or an industry becomes the main explanatory variable, controlling for the aforementioned economic factors. The statistical modeling presented here adopts the second approach.

Estimating the impact of migration on such economic factors as GDP per capita, wages, and unemployment, calls for a basic, aggregate migration model:

\[ Y = \beta_0 + \beta_1 MS + \beta_2 GDPC + \beta_3 W + \beta_4 UE + \beta_5 LU + \beta_6 POLS + \varepsilon, \]

where \( MS \) is the migrant stock in each destination country \( j \) for beginning year \( i \) to destination \( j \) at ending year \( t \). \( \beta_0 \) is the intercept of the equation, \( \beta_1 \) to \( \beta_6 \) are parameters to be estimated, \( GDPC \) is gross domestic per capita, \( W \) is average wage rates, \( UE \) is the unemployment rate, \( LU \) is long-term unemployment rate, \( POLS \) is the migration policy at the time of accession, and \( \varepsilon \) is the residual error term. In the above equation, \( Y \) (the dependent variable) can be whichever economic indicator is being estimated in the main
equation (be it GDP per capita, wages, unemployment, or long-term unemployment).

Given that GDP per capita, wages, and unemployment tend to vary in tandem (Blanchflower and Oswald 1994; Kohler 2004; Prachowny 1993), it makes sense that whenever one of these factors is used as the dependent variable $Y$ in the above equation, the retention of the remaining variables as statistical controls is justified.

In the above equation, it is important to note the model’s assumptions. Consideration should also be given to alternative models to determine which formulation provides a better fit in identifying an outcome variable as a function of migration determinants. Said considerations are discussed below.

Data Analysis Strategy

*Level and Logarithmic Regression*

The data for this investigation were analyzed through the use of ordinary least squares (OLS) regression. As Ritchey (2008) notes, OLS regression helps discover linear statistical relationships at the multivariate level. Wooldridge (2002) notes that regression analysis “is more amenable to ceteris paribus analysis because it allows to explicitly [italics his] control for many other factors which simultaneously affect the dependent variable” (66). Wooldridge goes on to note how the *ceteris paribus* function of OLS regression is especially important when testing economic theories and data.

Three separate dependent variables (GDP per capita, unemployment, and wages) are regressed on the independent variables as a function of the three separate hypotheses under investigation. For each of the three hypotheses, seven regression models are constructed. The first model examines the relationship between a dependent variable and the various independent variables for all six destination countries for each of the three
hypotheses. The remaining six OLS regression models examine each country separately: A separate OLS regression equation is calculated for Denmark, France, Ireland, Germany, Sweden, and the United Kingdom for each of the three hypotheses. A total of twenty-one separate OLS regression models are calculated as part of this project. For each regression model, goodness of fit is calculated via the $R^2$ value. Missing values for all independent variables are substituted with the means for each independent variable. Using this substitution strategy, all 132 data points in the sample are used.

An alternative approach using OLS regression is to consider the linear relationships among log-transformed variables. The benefit of using the natural log transformation of variables in a regression equation is that it allows coefficients to be interpreted more specifically in terms of their elasticities. In other words, log-transformed variables allows the research to state how a 1 percent change in an independent variable will cause a specific percentage change in the dependent variable, with the exact change being equivalent to the unstandardized regression coefficient for that independent variable (Gujarati and Porter 2009).

Log-transformation of variables in an OLS regression equation is also appropriate when one or more of the assumptions of OLS regression have been violated. Allison (1999) notes that OLS regression has four primary assumptions, linearity, homoscedasticity, independence of errors, and normality of errors. When one or more of these assumptions are violated, a nonlinear transformation of the independent and dependent variables is the normal corrective measure. Said correction can be achieved via a log-transformation of the data, precisely because the process of log-transformations reduces variation, thereby limiting the potential of heteroscedasticity with respect to both
the data and the residuals in a regression equation (Nau 2005). Heteroscedasticity typically occurs when the variance of the error terms differ across observations, which is a potential shortcoming of OLS regression (Wooldridge 2002). However, it should be noted that log-transformed variables in an OLS model only demonstrate association between variables, which may lead to a bias in the resulting estimates that is higher than the bias in OLS estimates (Wooldridge 2002).

**Data Issues**

As noted, missing values for all independent variables were substituted with the means for each of the continuous variables in order to maximize effective sample size. Multicollinearity problems were avoided through an examination of the variance inflation factors (VIFs) associated with each coefficient in the various statistical models. A VIF of 1 suggests that variance is not inflated and there is no correlation among the predictor variables in the model. A VIF greater than 5 suggests there may be collinearity associated with the explanatory variables requiring correction. A VIF of 10 or above typically indicates problematic multicollinearity problems (Myers 1986). The VIFs for a majority of the coefficients in the various models were well under 10. Nevertheless, several of the models did have problems with multicollinearity. Multicollinearity problems encountered during the statistical analyses will be discussed as part of the next chapter.

**Analysis**

Tables 7 through 13 present the means and standard deviations for all variables used in the current investigation. Table 7 provides descriptive statistics for the variables used as part of the various statistical analyses. The first variable is migrant stock, measured in thousands of migrants. Its mean shows that between the years 1989 and 2010,
an average of about 2.3 million individuals migrated from the A10 countries to the six
destination countries. The second variable estimates the unemployment rate in the six
destination countries during the years 1989 to 2010. Unemployment rate has an average
of 7.9 percent and ranges from a low of 1.6 percent to a high of 16.2 percent. Long-term
unemployment for the six destination countries has an average of 34.8 percent and ranges
between 7.2 percent and 66 percent. The fourth variable used in the analysis is average
gross monthly wages. Average gross monthly wages for the six destination countries
between 1989 and 2010 in US dollars are about three thousand dollars a month
($3,042.25). The GDP per capita for all six destination countries from 1989 to 2010 is the
fifth variable used in the current study and is measured in US dollars. As can be seen in
Table 7, the average for this variable was about twenty-seven thousand dollars
($26,774.39). This variable ranges from a low of approximately eleven thousand dollars
to a high of about forty-five thousand dollars. The final variable used in this study is a
dummy variable constructed to indicate whether or not a given destination country has a
policy governing migration. Three of the six countries had this policy: Ireland, Sweden
and the United Kingdom.

Table 7

*Means and Standard Deviations for All Variables: All Six Destination Countries*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>2,306.52</td>
<td>2,425.84</td>
<td>78.00</td>
<td>7,365.83</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>7.88</td>
<td>2.96</td>
<td>1.60</td>
<td>16.20</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>34.77</td>
<td>13.66</td>
<td>7.20</td>
<td>66.00</td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>3,042.25</td>
<td>885.18</td>
<td>1,975.60</td>
<td>5,969.70</td>
</tr>
<tr>
<td>Policy governing migration (1 = yes)</td>
<td>.50</td>
<td>.50</td>
<td>.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Gross domestic product per capita</td>
<td>26,774.39</td>
<td>7,661.26</td>
<td>11,642.69</td>
<td>44,749.29</td>
</tr>
</tbody>
</table>

*Note: N = 132.*
Table 8 provides descriptive statistics for the variables used as part of the various statistical analyses for Denmark. The first variable is migrant stock, measured in thousands of migrants. The mean shows that between the years of 1989 and 2010, an average of 247,500 immigrants entered Denmark. The second variable estimates the unemployment rate in Denmark between the years of 1989 and 2010. The average is 6.2 percent and ranged from a low of 3.4 percent to a high of 10.7 percent. Long-term unemployment for Denmark has an average of 22.6 percent and ranged between a low of 7.2 percent and a high of 32.1 percent. Average gross monthly wages, as measured in US dollars, are $3,706.44, with a range of $2,722.40 to a high of $5,970.70. The fifth variable, GDP per capita as measured in US dollars, is $28,193.47 for Denmark, with a low of $17,488.04 to a high of $40,600.19.

Table 8

Means and Standard Deviations for All Variables: Denmark

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>247.49</td>
<td>54.38</td>
<td>150.65</td>
<td>346.05</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>6.16</td>
<td>2.03</td>
<td>3.40</td>
<td>10.70</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>22.64</td>
<td>6.14</td>
<td>7.20</td>
<td>32.10</td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>3,706.44</td>
<td>1,022.19</td>
<td>2,722.40</td>
<td>5,969.70</td>
</tr>
<tr>
<td>Gross domestic product per capita</td>
<td>28,193.47</td>
<td>7,278.65</td>
<td>17,488.04</td>
<td>40,600.19</td>
</tr>
</tbody>
</table>

Note: N = 22.

Table 9 provides descriptive statistics for the variables used as part of the various statistical analyses for France. As before with Denmark and all six countries, the first variable is migrant stock, measured in thousands of migrants. Its mean shows that between the years of 1989 and 2010, an average of 3.5 million immigrants entered France. The second variable, unemployment rate, has an average of 10 percent during the twenty-one year time period under investigation, and ranges from a low of 7.4 percent to a high
of 12.6 percent between the years of 1989 and 2010. Long-term unemployment for France has an average rate of 39.5 percent and ranges between a low of 33.8 percent and a high of 44.2 percent. Average gross monthly wages, again measured in US dollars, are $2,715.55 for France. The range of wages is as low as just over two thousand dollars ($2,042.00) to as high as just over four thousand dollars ($4,143.00). GDP per capita for France between 1989 and 2010 is measured in US dollars. Table 9 shows an average of approximated twenty-five thousand ($24,938.20).

Table 9

Means and Standard Deviations for All Variables: France

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>3,515.06</td>
<td>128.05</td>
<td>3,258.50</td>
<td>3,769.02</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>10.00</td>
<td>1.62</td>
<td>7.40</td>
<td>12.60</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>39.49</td>
<td>2.97</td>
<td>33.80</td>
<td>44.20</td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>2,715.55</td>
<td>623.44</td>
<td>2,042.00</td>
<td>4,143.00</td>
</tr>
<tr>
<td>Gross domestic product per capita</td>
<td>24,938.20</td>
<td>6,013.89</td>
<td>16,239.96</td>
<td>34,394.74</td>
</tr>
</tbody>
</table>

Note: N = 22.

Table 10 provides descriptive statistics for the variables used as part of the various statistical analyses for Germany. The first variable is migrant stock, measured in thousands of migrants. Its mean shows that between the years of 1989 and 2010, an average of 6.7 million immigrants migrated to Germany. The second variable estimated the unemployment rate in Germany during the years of 1989 to 2010. The unemployment rate has an average of 8.25 percent, and ranges from a low of 4.90 percent to a high of 11.2 percent. Long-term unemployment for Germany has an average of 48.2 percent and ranges between 31.6 percent and 56.6 percent. The fourth variable used is average gross monthly wages. Average gross monthly wages for Germany between 1989 and 2010 in US dollars is $2,774.44. The GDP per capita for Germany is the fifth variable used and is
also measured in US dollars. Table 10 shows that for GDP, the average is just under twenty-seven thousand ($26,615.40). This variable ranges from a low of just over seventeen thousand dollars ($17,088.77) to a high of just over thirty-seven thousand dollars ($37,660.77).

Table 10

Means and Standard Deviations for All Variables: Germany

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>6,790.12</td>
<td>666.50</td>
<td>4,845.90</td>
<td>7,365.83</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>8.25</td>
<td>1.70</td>
<td>4.90</td>
<td>11.20</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>48.16</td>
<td>6.28</td>
<td>31.60</td>
<td>56.60</td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>2,774.44</td>
<td>499.31</td>
<td>2,141.00</td>
<td>3,927.90</td>
</tr>
<tr>
<td>Gross domestic product per capita</td>
<td>26,615.40</td>
<td>6,234.92</td>
<td>17,088.77</td>
<td>37,660.77</td>
</tr>
</tbody>
</table>

Note: N = 22.

Table 11 provides descriptive statistics for the variables used as part of the various statistical analyses for Ireland. The first variable is migrant stock, measured in thousands of migrants. Its mean shows that between the years of 1989 and 2010, an average of 141,700 A10 immigrants migrated to Ireland. The second variable estimates the unemployment rate in Ireland during the years of 1989 to 2010. The unemployment rate has an average of 9.3 percent and ranges from a low of 3.7 percent to a high of 16.2 percent. Long-term unemployment for Ireland has an average of 47.1 percent and ranges between 27.1 percent and 66 percent. The fourth variable used is average gross monthly wages. Average gross monthly wages for Ireland between 1989 and 2010 in US dollars are $3,235.97. The GDP per capita for Germany is the fifth variable used and is measured in US dollars. Table 11 reveals that the average for this variable is just over twenty-seven thousand ($27,521.40). This variable ranges from a low of just over eleven thousand dollars ($11,642.69) to a high of just under forty-five thousand dollars ($44,749.29).
Table 11

Means and Standard Deviations for All Variables: Ireland

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>141.70</td>
<td>74.63</td>
<td>78.00</td>
<td>413.22</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>9.33</td>
<td>4.78</td>
<td>3.70</td>
<td>16.20</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>47.07</td>
<td>14.29</td>
<td>27.10</td>
<td>66.00</td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>3,235.97</td>
<td>1,170.18</td>
<td>1,975.60</td>
<td>5,824.60</td>
</tr>
<tr>
<td>Gross domestic product per capita</td>
<td>27,521.40</td>
<td>11,195.28</td>
<td>11,642.69</td>
<td>44,749.29</td>
</tr>
</tbody>
</table>

Note: N = 22.

Table 12

Means and Standard Deviations for All Variables: Sweden

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>504.44</td>
<td>45.94</td>
<td>452.76</td>
<td>633.29</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>6.71</td>
<td>2.47</td>
<td>1.60</td>
<td>10.40</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>20.41</td>
<td>7.29</td>
<td>11.20</td>
<td>33.50</td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>2,734.30</td>
<td>612.60</td>
<td>1,990.00</td>
<td>4,200.00</td>
</tr>
<tr>
<td>Gross domestic product per capita</td>
<td>27,592.54</td>
<td>7,221.00</td>
<td>18,514.48</td>
<td>39,613.41</td>
</tr>
</tbody>
</table>

Note: N = 22.

Table 12 provides descriptive statistics for the variables used as part of the various statistical analyses for Sweden. The first variable is migrant stock, measured in thousands of migrants. Its mean shows that between the years of 1989 and 2010, an average of 504,440 immigrants entered Sweden. The second variable estimates the unemployment rate in Sweden during the years of 1989 to 2010. Unemployment rate has an average of 6.7 percent and ranges from a low of 1.6 percent to a high of 10.4 percent. Long-term unemployment for Sweden has an average of 20.41 percent and ranges between 11.2 percent and 33.5 percent. The fourth variable examined is average gross monthly wages. Average gross monthly wages for Sweden between 1989 and 2010 in US dollars are $2,734.30. The GDP per capita for Sweden is the fifth variable used and is
also measured in US dollars. In Table 12, the average for this variable is just under twenty-eight thousand ($27,592.54). This variable ranges from a low of just over seventeen thousand dollars ($18,514.48) to a high of just under forty thousand dollars ($39,613.41).

Table 13

*Means and Standard Deviations for All Variables: United Kingdom*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>2,640.32</td>
<td>882.07</td>
<td>1,723.00</td>
<td>4,524.00</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>6.84</td>
<td>1.82</td>
<td>4.60</td>
<td>10.40</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>30.83</td>
<td>8.06</td>
<td>20.60</td>
<td>45.40</td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>3,086.79</td>
<td>818.86</td>
<td>2,101.90</td>
<td>4,805.60</td>
</tr>
<tr>
<td>Gross domestic product per capita</td>
<td>25,785.32</td>
<td>7,257.28</td>
<td>15,607.80</td>
<td>36,058.92</td>
</tr>
</tbody>
</table>

*Note: N = 22.*

Table 13 provides descriptive statistics for the variables used as part of the various statistical analyses for the United Kingdom. The first variable is migrant stock, measured in thousands of migrants. Its mean shows that between the years of 1989 and 2010, an average of 2,640,320 A10 immigrants entered the United Kingdom. The second variable estimates the unemployment rate in the United Kingdom during the years of 1989 to 2010. The unemployment rate has an average of 6.8 percent and ranges from a low of 4.6 percent to a high of 10.4 percent. Long-term unemployment for the United Kingdom has an average of 30.8 percent and ranges between 20.6 percent and 45.4 percent. The fourth variable used was average gross monthly wages. Average gross monthly wages for the United Kingdom between 1989 and 2010 in US dollars are just over three thousand dollars ($3,086.79). The GDP per capita for the United Kingdom is the fifth variable used and is measured in US dollars. As can be seen in Table 13, the average for this variable is just under twenty-six thousand dollars ($25,785.32). This
variable ranges from a low of just over fifteen thousand six hundred dollars ($15,607.80) to a high of just over thirty-six thousand dollars ($36,058.92).

**OLS Regression Assumptions**

Allison (1999) outlines that several assumptions that must be met in regression: *linearity, homoscedasticity, independence of errors, and normality of errors*. The first assumption, *linearity*, proposes that the relationships of the variables under investigation are linear in nature. The way to investigate whether this assumption holds is to check what is known as the *plot of the regression standardized residuals*, or the *Normal P-P Plot*. Each regression presented below estimated a Normal P-P plot as a way of testing the first assumption. As long as a linear trend is evident in the plot, the assumption of linearity is met (Mertler and Vannatta 2010). If this assumption is violated, a nonlinear transformation of the independent and dependent variables is the normal corrective measure. Said correction can be achieved via a log-transformation of the data (Nau 2005).

The second assumption, *homoscedasticity*, confirms that the degree of random noise (or error) in the regression equation remains relatively constant (Allison 1999). Although homoscedasticity can be checked by plotting the observed value of the dependent variable against the predicted value of the dependent variable, the Breusch–Pagan Test (Breusch and Pagan 1979) more efficiently tests this assumption. The Breusch–Pagan Test is essentially a chi-square test for heteroscedasticity. As part of the test, if the value of chi-square is statistically significant, then the data are considered heteroscedastic and corrective measures are required. For each of the OLS regression equations presented below, the Breusch–Pagan test was conducted to determine if the second assumption was violated. Several authors (Allison 1999; Breusch and Pagan
1979; Mertler and Vannatta 2010) recommend a log-transformation of the data being analyzed as a corrective measure in the case of heteroscedasticity.

The third assumption, *independence of errors*, confirms that the disturbance terms in the equation are uncorrelated. Although this type of assumption can be checked via an autocorrelation plot of the residuals (Nau 2005), a more efficient way to check this assumption is to calculate the Durbin–Watson statistic (Gujarati 2003). The Durbin–Watson statistic ranges from 0 to 4, with a mid-range value of 2. As a general rule, values of the Durbin–Watson statistic closer to 2 indicate independence of errors; values below 1 and above 3 suggest correlation of errors (Gujarati 2003). For each OLS regression discussed below, the Durbin–Watson statistic was calculated and checked to determine if the model violated the third assumption of regression. When the value of the Durbin–Watson is extreme (generally above 3.4 or below 0.6), either a log-transformation of the data or a lagged regression model is recommended as corrective action (Gujarati 2003).

The final assumption, *normality of errors*, is the least important of the four assumptions (Allison 1999). This assumption is predicated on the understanding that all errors are normally distributed in a regression equation. As Allison (1999) notes, this assumption is critical only when there are fewer than 100 cases in a sample. Although a normal probability plot of the residuals (Nau 2005) can be used to test this assumption, the Shapiro–Wilk Test of the standardized residuals is more efficient (Shapiro and Wilk 1965). As before, the Shapiro–Wilk Test was calculated for each of the OLS regression equations to determine if the fourth and final assumption of regression was violated. If the Shapiro–Wilk Test is statistically significant, a nonlinear transformation of the variables (such as a log-transformation) remediates the problem (Nau 2005).
The first research question seeks the impact of migration on a given destination country’s economic growth. To that end, the following hypothesis has been developed:

\( H_0 \) Destination-country GDP per capita is unaffected by migration from the A10 origin countries.

\( H_1 \) Destination-country GDP per capita is positively affected by migration from the A10 origin countries.

Table 14

Unstandardized Coefficients from the OLS Regression of Gross Domestic Product per Capita on All Independent Variables for All Six Destination Countries

<table>
<thead>
<tr>
<th>Variable</th>
<th>( B )</th>
<th>( SE(B) )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>0.79</td>
<td>0.23</td>
<td>***</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>-308.02</td>
<td>202.30</td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>-68.59</td>
<td>47.67</td>
<td></td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>6.00</td>
<td>0.53</td>
<td>***</td>
</tr>
<tr>
<td>Policy governing migration (1 = yes)</td>
<td>2,134.80</td>
<td>997.33</td>
<td>*</td>
</tr>
<tr>
<td>Constant</td>
<td>10,446.19</td>
<td>2,708.05</td>
<td>***</td>
</tr>
<tr>
<td>( N )</td>
<td>132.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>.61</td>
<td>***</td>
<td></td>
</tr>
</tbody>
</table>

Breusch–Pagan Test
\( \chi^2 \) 1.80 \((p > .05)\)
\( df \) 127

Durbin–Watson statistic
\( DW \) 1.23

Shapiro–Wilk statistic
\( SW \) 0.97 **
\( df \) 132

Note: *\( p < .05 \), **\( p < .01 \), ***\( p < .001 \), two-tailed tests.

In order to empirically investigate this hypothesis, an OLS regression equation which regresses GDP per capita onto several predictors has been estimated in Table 14. Table 14 contains the statistical results for the OLS regression of GDP per capita onto the various predictors for all six destination countries. For this regression, it is assumed that the six
destination countries are affected in the same way by immigrants. Later regressions will disaggregate the six countries to empirically determine if this assumption holds.

Figure 2. Normal P-P Plot for the OLS regression results contained in Table 14. Dependent variable: Gross domestic product per capita, US dollars, current price, current PPPs, pegged to 2005 dollar. Unit of measured is actual 2005 US dollars.

The overall model is statistically significant. Furthermore, 61 percent of the variation in the dependent variable is accounted for by the five independent variables, suggesting a very good model fit. The Normal P-P Plot (see Figure 2) suggests linearity of the variables under regression, thus satisfying the first assumption mentioned above. The Breusch–Pagan Test was statistically nonsignificant, so the model in Table 14 satisfies the homoscedasticity assumption. The Durbin–Watson statistic for this regression suggests a slight to moderate possibility of a violation of the assumption of independence of error terms. Finally, the Shapiro–Wilk statistic was statistically significant, suggesting a violation of the normality-of-errors assumption.¹

Among the five independent variables, three emerge as statistically significant predictors of GDP per capita. These three independent variables are migrant stock, average gross monthly wages, and the presence of a policy governing migration, each of }

¹Given that three of the four regression assumptions are unviolated in the models presented in Table 8, log-transformed regressions will be conducted later in this chapter.
which has a positive relationship to the dependent variable. That is to say, higher levels of migrant stock in the six destination countries increase GDP per capita, supporting the first hypothesis. This is most likely an artifact of how GDP per capita is calculated as it is highly correlated with wages. Finally, the three countries that have a policy governing migration (Ireland, Sweden, and the United Kingdom) also boast higher GDP per capita compared to the other three destination countries (Denmark, France, and Germany).

Table 15 contains the statistical results for the regression of GDP per capita on each of the six disaggregated destination countries to check the assumption that all six destination countries can be treated as roughly equal. In addition, the four assumptions of regression are again checked for each of the six disaggregated destination countries. The Normal P-P Plots (see Figure 3) for all six countries suggest linearity of the variables under regression, thus satisfying the first assumption of linearity. The Breusch–Pagan Test was statistically nonsignificant for five of the six countries, showing that the models in Table 15 for five of the six destination countries satisfy the homoscedasticity assumption. However, the assumption was violated for Ireland, suggesting a log-transformation of the variables under investigation. The Durbin–Watson statistic for the regression of GDP per capita on the predictors for the six disaggregated destination countries ranged from 0.36 to 1.28, suggesting a moderate to severe possibility of dependence of the error terms. Finally, the Shapiro–Wilk statistic was statistically nonsignificant for four of the six destination countries; it was statistically significant for the other two, suggesting a violation of the normality-of-errors assumption.²

²Given that three of the four regression assumptions are present in the models presented in Table 15, log-transformed regressions will be conducted at a later point in this chapter.
Among the destination countries, the results for Denmark, Germany, and the United Kingdom support the first hypothesis. The results for France, Ireland and Sweden do not support the first hypothesis. A further examination of the statistical evidence in support of the first hypothesis is provided below.

Table 15

*Unstandardized Coefficients from the OLS Regression of Gross Domestic Product per Capita on All Independent Variables for the Six Individual Destination Countries*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Denmark</th>
<th>France</th>
<th>Germany</th>
<th>Ireland</th>
<th>Sweden</th>
<th>United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>90.64</td>
<td>0.89</td>
<td>4.57</td>
<td>15.81</td>
<td>15.46</td>
<td>5.95</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>-235.25</td>
<td>-1,183.54</td>
<td>-637.24</td>
<td>-29.4</td>
<td>-269.09</td>
<td>-1,297.13</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>-142.53</td>
<td>72.27</td>
<td>158.45</td>
<td>93.21</td>
<td>93.21</td>
<td>25.12</td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>1.53</td>
<td>5.21</td>
<td>9.07</td>
<td>3.19</td>
<td>9.07</td>
<td>0.58</td>
</tr>
<tr>
<td>Constant</td>
<td>4,763.27</td>
<td>16,646.59</td>
<td>-31,946.41</td>
<td>35,916.78</td>
<td>16,900.18</td>
<td>17,928.89</td>
</tr>
<tr>
<td>BREUWSC–PAGAN TEST</td>
<td></td>
<td></td>
<td></td>
<td>0.83</td>
<td>6.95</td>
<td>2.90</td>
</tr>
<tr>
<td>Durbin–Watson statistic</td>
<td></td>
<td></td>
<td></td>
<td>1.28</td>
<td>0.36</td>
<td>0.83</td>
</tr>
<tr>
<td>SHAPIRO–WILK statistic</td>
<td></td>
<td></td>
<td></td>
<td>0.95</td>
<td>0.93</td>
<td>0.94</td>
</tr>
<tr>
<td>N</td>
<td>22.00</td>
<td>22.00</td>
<td>22.00</td>
<td>22.00</td>
<td>22.00</td>
<td>22.00</td>
</tr>
<tr>
<td>R²</td>
<td>.96***</td>
<td>.58**</td>
<td>.66***</td>
<td>.88***</td>
<td>.64***</td>
<td>.95***</td>
</tr>
</tbody>
</table>

Note: *p < .05, **p < .01, ***p < .001, two-tailed tests.
Figure 3. Normal P-P Plot for the OLS regression results contained in Table 15. Dependent variable: Gross domestic product per head, US dollars, current price, current PPPs, pegged to 2005 dollar. Unit of measured is actual 2005 US dollars.

The regression results for Denmark contained in Table 15 show that the overall model is statistically significant. In addition, 96 percent of the variation in the dependent
variable is accounted for by the independent variables, suggesting optimal model fit. Among the five independent variables, two emerge as statistically significant predictors of GDP per capita, migrant stock, and average gross monthly wages. Specifically, the results for Denmark show that increases in migrant stock subsequently increased overall GDP per capita, controlling for the other variables in the equation. Also, higher wages were associated with higher GDP per capita in Denmark, net of other factors.

Results in Table 15 show that for Germany, 66 percent of the variation in the dependent variable is accounted for by the independent variables. This suggests a very good model fit. Of the five independent variables, two emerge as statistically significant predictors of GDP per capita in Germany, migrant stock and gross monthly wages. The results for Germany show that increases in migrant stock increase overall GDP per capita, taking into account the simultaneous impact of other variables in the equation. Similarly, higher wages are associated with higher GDP per capita, controlling for other factors.

For the United Kingdom, 95 percent of the variation in the dependent variables is accounted for by the five independent variables, suggesting optimal model fit. As with Denmark and Germany, of the five independent variables, only two are statistically significant predictors of GDP per capita: migrant stock and the unemployment rate. Specifically, the results for the United Kingdom show that a rise in migrant stock increases overall GDP per capita, again controlling for the other variables in the equation. In contrast with the other models, average gross monthly wages are not associated with higher GDP. Instead, a lower unemployment rate is associated with a higher GDP per capita in the United Kingdom, net of other factors.
Table 16

Unstandardized Coefficients from the OLS Regression of the Natural Log of Gross Domestic Product per Capita on the Natural Log of All Independent Variables for All Six Destination Countries

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE(B)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>0.05</td>
<td>0.01</td>
<td>***</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>−0.08</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>−0.07</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>0.75</td>
<td>0.08</td>
<td>***</td>
</tr>
<tr>
<td>Policy governing migration (1 = yes)</td>
<td>0.06</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>4.21</td>
<td>0.69</td>
<td>***</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>132</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>R²</strong></td>
<td>.56</td>
<td></td>
<td>***</td>
</tr>
</tbody>
</table>

*Note: *p < .05, **p < .01, ***p < .001, two-tailed tests.*

Table 16 contains the results of the log-log regressions performed to correct the violations of the assumptions of linear regression associated with the model presented in Table 14. As stated previously with the regression results for Table 14, it is assumed that the six aggregated destination countries used in this analysis are roughly equivalent, at least with regard to the variables in the model. Subsequent log-log regressions will disaggregate the six countries to empirically investigate whether this assumption holds.

As previously noted in Chapter IV, part of the rationale behind conducting log-log regression is so that regression results can be discussed in terms of their elasticities. In other words, the regression results in a log-transformed model shows how a 1 percent change in an independent variable will cause a percentage change in the dependent variable equal to the unstandardized regression coefficient for that independent variable (Gujarati and Porter 2009).
As was the case in Table 14, the overall model is statistically significant. The model presented in Table 16 also has very good fit, as indicated by its $R^2$ value of 56 percent. Only two of the five variables emerge as statistically significant predictors in Table 16, migrant stock and average gross monthly wages. A 1 percent increase in migrant stock from the A10 countries to the six destination countries results in a 0.05 percent increase in GDP per capita. As was the case with the OLS regression results presented in Tables 14 and 15, this finding in the log-log regression results supports the first hypothesis. Average gross monthly wages were also positively associated with GDP per capita. As can be seen in Table 16, a 1 percent increase in average gross monthly wages is associated with a three-quarter point increase (0.75 percent) in GDP per capita.

Table 17

Unstandardized Coefficients from the OLS Regression of the Natural Log of Gross Domestic Product per Capita on the Natural Log of All Independent Variables for the Six Individual Destination Countries

<table>
<thead>
<tr>
<th>Variable</th>
<th>Denmark B</th>
<th>SE(B)</th>
<th>p</th>
<th>France B</th>
<th>SE(B)</th>
<th>p</th>
<th>Germany B</th>
<th>SE(B)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>0.70</td>
<td>0.11</td>
<td>**</td>
<td>−0.22</td>
<td>1.29</td>
<td></td>
<td>1.33</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>−0.15</td>
<td>0.06</td>
<td>*</td>
<td>−0.54</td>
<td>0.33</td>
<td></td>
<td>−0.21</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>−0.13</td>
<td>0.06</td>
<td>*</td>
<td>0.14</td>
<td>0.57</td>
<td></td>
<td>0.27</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>0.18</td>
<td>0.06</td>
<td>**</td>
<td>0.56</td>
<td>0.24</td>
<td>*</td>
<td>0.91</td>
<td>0.23</td>
<td>***</td>
</tr>
<tr>
<td>Constant</td>
<td>5.57</td>
<td>0.97</td>
<td>***</td>
<td>8.22</td>
<td>10.45</td>
<td></td>
<td>−9.38</td>
<td>5.08</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ireland B</th>
<th>SE(B)</th>
<th>p</th>
<th>Sweden B</th>
<th>SE(B)</th>
<th>p</th>
<th>United Kingdom B</th>
<th>SE(B)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>0.24</td>
<td>0.17</td>
<td></td>
<td>0.07</td>
<td>0.58</td>
<td></td>
<td>0.80</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>−0.15</td>
<td>0.14</td>
<td></td>
<td>0.12</td>
<td>0.13</td>
<td></td>
<td>−0.44</td>
<td>0.12</td>
<td>***</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>−0.51</td>
<td>0.33</td>
<td></td>
<td>0.03</td>
<td>0.18</td>
<td></td>
<td>0.03</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>0.38</td>
<td>0.23</td>
<td></td>
<td>0.89</td>
<td>0.23</td>
<td>***</td>
<td>−0.11</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>8.18</td>
<td>2.87</td>
<td>*</td>
<td>2.41</td>
<td>4.36</td>
<td></td>
<td>5.46</td>
<td>1.06</td>
<td>***</td>
</tr>
</tbody>
</table>

| N   | 22.00 | 22.00 | 22.00 |
| $R^2$ |      |     |    |

Note: *p < .05, **p < .01, ***p < .001, two-tailed tests.
Table 17 contains the results of the log-log regressions performed to correct the violations of the linear regression assumptions associated with the models presented in Table 15. The results in Table 17 are similar to those found in Table 15. That is to say, results for Denmark, Germany and the United Kingdom again support the first hypothesis, whereas the results for France, Ireland and Sweden do not. All four of the independent variables are statistically significant predictors of GDP per capita for Denmark. Specifically, Table 17 shows that a 1 percent increase in migrant stock in Denmark results in a 0.70 percent increase in GDP per capita. For every 1 percent decrease in the unemployment rate, there was a corresponding 0.15 percent decrease in GDP per capita. A similar trend was found for long-term unemployment. For every percent increase in long-term unemployment in Denmark, there was a 0.13 percent decrease in GDP per capita. Finally, Table 17 shows that a 1 percent increase in average gross monthly wages raised GDP per capita by nearly two-tenths of 1 percent (0.18 percent).

For Germany, of the five independent variables, only migrant stock and average gross monthly wages were significant. As can be seen in Table 17, for every 1 percent increase in migrant stock, there is a 1.33 percent increase in GDP per capita. Similarly, for every 1 percent increase in average gross monthly wages, there is a 0.91 percent increase in GDP per capita.

In the United Kingdom, for every 1 percent increase in migrant stock, GDP per capita increases 0.80 percent. In contrast, Table 17 shows that for every 1 percent increase in the unemployment rate, there is a 0.44 percent decrease in GDP per capita.

As noted in Chapter IV, the second research question seeks to understand whether immigrants are substitutes or complements to native workers in destination countries. In
other words, the second hypothesis probes if immigration creates a labor force that enjoys the fruits of its labor in the form of higher wages, or if it generates higher unemployment. To that end, the following hypotheses were developed.

\( H_02 \) The destination country’s unemployment rate will not be affected by migration from A10 origin countries, net of other factors.

\( H_a2 \) The destination country’s unemployment will be lowered by migration from A10 origin countries, net of other factors.

\( H_03 \) The destination country’s wages will not be affected by migration from A10 origin countries, net of other factors.

\( H_a3 \) The destination country’s wages will be negatively affected by migration from A10 origin countries, net of other factors.

To empirically investigate these two hypotheses, two OLS regression equations were estimated. The first set of equations regresses unemployment onto several predictors (see Tables 18 and 19), and the second set of equations regresses average gross monthly wages onto several predictors (see Tables 22 and 23).

As before with the OLS regression of GDP per capita on the various predictors, it is assumed in Table 18 that the six aggregated destination countries used in the analysis are roughly equivalent, at least with regard to the model’s variables. Even though this assumption is again being made in the regression equation in Table 18 where unemployment is the dependent variable, subsequent OLS regressions are conducted to disaggregate the six countries and empirically investigate whether this assumption holds.
Table 18

Unstandardized Coefficients from the OLS Regression of Unemployment on All
Independent Variables for All Six Destination Countries

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE(B)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>-.0002</td>
<td>.0001</td>
<td>*</td>
</tr>
<tr>
<td>Long term unemployment rate</td>
<td>0.14</td>
<td>.02</td>
<td>***</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Policy governing migration (1 = yes)</td>
<td>-0.49</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>5.76</td>
<td>1.14</td>
<td>**</td>
</tr>
<tr>
<td>N</td>
<td>132.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breusch–Pagan Test</td>
<td>χ²</td>
<td>13.67</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>df</td>
<td>127</td>
<td></td>
</tr>
<tr>
<td>Durbin–Watson statistic</td>
<td>DW</td>
<td>0.64</td>
<td></td>
</tr>
<tr>
<td>Shapiro–Wilk statistic</td>
<td>SW</td>
<td>0.97</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>df</td>
<td>132</td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .05, **p < .01, ***p < .001, two-tailed tests.

Figure 4. Normal P-P Plot for the OLS regression results contained in Table 18.
Dependent variable: Gross domestic product per head, US dollars, current price, current PPPs, pegged to 2005 dollar. Unit of measured is actual 2005 US dollars.

The overall model in Table 18 is statistically significant. Furthermore, 50 percent of the variation in the dependent variable is accounted for by the five independent variables, suggesting a very good model fit. The Normal P-P Plot (see Figure 4) suggests
linearity of the variables under regression, thus satisfying the first assumption mentioned above. The Breusch–Pagan Test was statistically significant, showing that the model in Table 18 is in violation of the homoscedasticity assumption. The Durbin–Watson statistic suggests a moderate to high possibility of a violation of the independence of error terms. Finally, the Shapiro–Wilk statistic was statistically significant, suggesting a violation of the normality-of-errors assumption.\(^3\)

The results in Table 18 seem to suggest that migration lowers unemployment. However, due to the incredibly small size of the unstandardized coefficient, the magnitude of the effect associated with this result should be considered marginal at best. Nevertheless, the coefficient for migrant stock suggests that as migrant stock increases, unemployment decreases, which provides support for the second hypothesis. In contrast, there is a direct relationship between long-term unemployment and the dependent variable; as long-term unemployment increases, unemployment increases.

Table 19 contains the statistical results for the regression of unemployment upon each of the six disaggregated destination countries to check the assumption that the six destination countries can be treated as roughly equal. In addition, the four regression assumptions are again checked for each of the six disaggregated destination countries. The Normal P-P Plots (see Figure 5) for all six countries suggest linearity of the variables under regression, thus satisfying the first assumption of linearity. The Breusch–Pagan Test was statistically nonsignificant for five of the six countries, showing that the models in Table 19 for five of the six destination countries satisfy the homoscedasticity assumption. However, the assumption was violated for Denmark, suggesting the need for

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\(^3\)Given that three of the four regression assumptions have been violated in the regression model presented in Table 12, log-transformed regressions will be conducted at a later point in this chapter.
a log-transformation of the variables under investigation. The Durbin–Watson statistic for the regression of unemployment on the predictors for the six disaggregated destination countries ranged from 0.54 to 1.03, suggesting a moderate to almost certain possibility of a violation of the independence of error terms. Finally, the Shapiro–Wilk statistic was statistically nonsignificant for four of the six destination countries; but it was statistically significant for two of the six destination countries, suggesting a violation of the normality-of-errors assumption.4

Before a discussion of the results contained in Table 19 can take place, several aspects of the OLS regression equations must first be noted. For example, the results for Denmark must be viewed skeptically, given that there is some problematic multicollinearity in the model. Specifically, the variable migrant stock has a VIF of 15.82, and the variable GDP per capita has a VIF of 22.71. Even though there is problematic multicollinearity in the model for Denmark, migrant stock and GDP per capita were retained in the model, as both variables are primary focal independent variables necessary for proper evaluation of the second hypothesis.

Similarly the results for the United Kingdom in Table 19 must be also be viewed skeptically, as there is problematic multicollinearity in this model as well: the VIF for migrant stock is 7.46, and the VIF for GDP is 13.09. As with Denmark, both variables were retained in the model despite problematic multicollinearity as migrant stock and GDP per capita are primary focal independent variables necessary for proper evaluation of the second hypothesis.

---

4Because three of the four regression assumptions are violated in the models presented in Table 13, log-transformed regressions are conducted later in this chapter.
Table 19

Unstandardized Coefficients from the OLS Regression of Unemployment on All Independent Variables for the Six Individual Destination Countries

<table>
<thead>
<tr>
<th>Variable</th>
<th>Denmark</th>
<th></th>
<th>France</th>
<th></th>
<th>Germany</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( B )</td>
<td>( SE(B) )</td>
<td>( p )</td>
<td>( B )</td>
<td>( SE(B) )</td>
<td>( p )</td>
</tr>
<tr>
<td>Migrant stock</td>
<td>-0.02</td>
<td>0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>-0.17</td>
<td>0.09</td>
<td>0.12</td>
<td>0.10</td>
<td>0.11</td>
<td>0.05</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>( N )</td>
<td>22.00</td>
<td></td>
<td>22.00</td>
<td>22.00</td>
<td>22.00</td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>.59*</td>
<td></td>
<td>.46*</td>
<td>.66**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breusch–Pagan Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \chi^2 )</td>
<td>12.92*</td>
<td></td>
<td>2.93 (p &gt; .05)</td>
<td></td>
<td>4.89 (p &gt; .05)</td>
<td></td>
</tr>
<tr>
<td>( df )</td>
<td>17</td>
<td></td>
<td>17</td>
<td></td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Durbin–Watson statistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( DW )</td>
<td>0.57</td>
<td></td>
<td>0.54</td>
<td></td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>Shapiro–Wilk statistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( SW )</td>
<td>0.94 (p &gt; .05)</td>
<td></td>
<td>0.90*</td>
<td></td>
<td>0.97 (p &gt; .05)</td>
<td></td>
</tr>
<tr>
<td>( df )</td>
<td>22</td>
<td></td>
<td>22</td>
<td></td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( B )</td>
<td>( SE(B) )</td>
<td>( p )</td>
<td>( B )</td>
<td>( SE(B) )</td>
<td>( p )</td>
</tr>
<tr>
<td>Migrant stock</td>
<td>-0.01</td>
<td>0.01</td>
<td>0.03</td>
<td>0.01***</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>0.28</td>
<td>0.11*</td>
<td>0.25</td>
<td>0.05***</td>
<td>0.10</td>
<td>0.04</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>-0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Constant</td>
<td>-5.41</td>
<td>8.62</td>
<td>-14.24</td>
<td>4.21**</td>
<td>6.79</td>
<td>2.38*</td>
</tr>
<tr>
<td>( N )</td>
<td>22.00</td>
<td></td>
<td>22.00</td>
<td>22.00</td>
<td>22.00</td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>.73***</td>
<td></td>
<td>.69***</td>
<td>.83***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breusch–Pagan Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \chi^2 )</td>
<td>9.01 (p &gt; .05)</td>
<td></td>
<td>9.87 (p &gt; .05)</td>
<td></td>
<td>6.43 (p &gt; .05)</td>
<td></td>
</tr>
<tr>
<td>( df )</td>
<td>17</td>
<td></td>
<td>17</td>
<td></td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Durbin–Watson statistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( DW )</td>
<td>0.80</td>
<td></td>
<td>0.92</td>
<td></td>
<td>1.03</td>
<td></td>
</tr>
<tr>
<td>Shapiro–Wilk statistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( SW )</td>
<td>0.84**</td>
<td></td>
<td>0.94 (p &gt; .05)</td>
<td></td>
<td>0.92 (p &gt; .05)</td>
<td></td>
</tr>
<tr>
<td>( df )</td>
<td>22</td>
<td></td>
<td>22</td>
<td></td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

Note: *\( p < .05 \), **\( p < .01 \), ***\( p < .001 \), two-tailed tests.

Lastly, in Table 19, the results for France must be viewed skeptically. Although all VIFs are 2 or less for the France regressions, it is considered a rare oddity to have a statistically significant model with no significant unstandardized coefficients, although not impossible (Agresti and Finlay 2009). This particular outcome may have something
to do with the substitution of mean values for missing data on the independent variables for France. However, this explanation is speculative at best and is only offered here as a potential explanatory factor for said results.

Figure 5. Normal P-P Plot for the OLS regression results contained in Table 19. Dependent variable: Unemployment rates by sex, age and nationality, in percentage of
active labor pool, aged 15 to 74, both sexes.

Of note in Table 19 are the results for Germany, Sweden, and the United Kingdom. For each of these countries, results show that as migrant stock increases, unemployment also increases. Results in Germany, Sweden, and the United Kingdom with respect to migrant stock not only provide no support for the second hypothesis, they also contradict the results in Table 18.

In light of the results in Table 19 concerning the relationship between migrant stock and unemployment in Germany, Sweden, and the United Kingdom, the results of Table 18 with respect to migrant stock and unemployment should be considered a statistical fluke. The true relationship between migrant stock and unemployment (controlling for other variables) is most likely held in Table 19, and the results in Table 18 for the relationship between migrant stock and unemployment (net of other factors) are likely the outcome of the conflation of three nonsignificant countries (Denmark, France and Ireland) with three significant countries (Germany, Sweden and the United Kingdom). Taken together, the evidence suggests no support for the second hypothesis.

Additional statistical results in the three significant countries are as follows: For Germany, there is positive relationship between long-term unemployment and unemployment; as long-term unemployment increases, unemployment increases. Similarly, there is a positive relationship between long-term unemployment and regular unemployment for Sweden and the United Kingdom. Lastly, for the United Kingdom, as GDP per capita increases, unemployment decreases.

Table 20 contains the results of the log-log regressions performed to correct the violations of the assumptions of linear regression associated with the model presented in
Table 18. The natural log transformations of the independent and dependent variable also give a more accurate estimate of the relationships between variables used to test the second hypothesis, given that results can be expressed in terms of elasticities.⁵ As shown in Table 20, there is no support for H2, as migrant stock is not statistically related to unemployment. Moreover, Table 20 reveals that a 1 percent change in long-term unemployment rate contributes to a 0.49 percent change in unemployment rate.

Table 20

*Unstandardized Coefficients from the OLS Regression of the Natural Log of Unemployment on the Natural Log of All Independent Variables for All Six Destination Countries*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE(B)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>-0.01</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>0.49</td>
<td>0.07***</td>
<td></td>
</tr>
<tr>
<td>GDP per capita</td>
<td>-0.21</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>-0.09</td>
<td>0.16</td>
<td></td>
</tr>
<tr>
<td>Policy governing migration (1 = yes)</td>
<td>-0.08</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>3.20</td>
<td>1.22**</td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .05, **p < .01, ***p < .001, two-tailed tests.

It should be noted that Table 21 has similar problems with multicollinearity that were seen with the models in Table 19. In Denmark, migrant stock has a VIF of 17.83, while GDP per capita has a VIF of 24.88. As was the case in Table 19, the United Kingdom again has problematic multicollinearity (migrant tock VIF is 8.70; GDP per

---

⁵As before with the OLS regression of unemployment on the various predictors, it is assumed that the six aggregated destination countries used in the log-log regression analysis are roughly equivalent, at least with regard to the variables in the model. Even though this assumption is again being made in the log-log regression equation presented in Table 14, subsequent log-log regressions will be conducted to disaggregate the six countries and empirically investigate whether or not this assumption holds.
capita VIF is 11.31). Nevertheless, these variables were left in the models for Denmark and the United Kingdom as migrant stock and GDP per capita are primary focal independent variables necessary for proper evaluation of the second hypothesis.

Table 21

**Unstandardized Coefficients from the OLS Regression of the Natural Log of Unemployment on the Natural Log of All Independent Variables for the Six Individual Destination Countries**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Denmark</th>
<th>France</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE(B)</td>
<td>p</td>
</tr>
<tr>
<td>Migrant stock</td>
<td>0.11</td>
<td>0.72**</td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>−0.61</td>
<td>0.17**</td>
<td></td>
</tr>
<tr>
<td>GDP per capita</td>
<td>−1.68</td>
<td>0.75*</td>
<td></td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>0.12</td>
<td>0.26</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>19.23</td>
<td>3.55***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>.75***</td>
<td>.58*</td>
<td>.74***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ireland</th>
<th>Sweden</th>
<th>United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE(B)</td>
<td>p</td>
</tr>
<tr>
<td>Migrant stock</td>
<td>−.36</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>1.17</td>
<td>0.52*</td>
<td></td>
</tr>
<tr>
<td>GDP per capita</td>
<td>−.43</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>Average gross monthly wages</td>
<td>.83</td>
<td>0.37*</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>−2.92</td>
<td>5.83</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>.74***</td>
<td>.66***</td>
<td>.86***</td>
</tr>
</tbody>
</table>

*Note: *\( p < .05, **p < .01, ***p < .001, \) two-tailed tests.*

The log-transformations of the data clarifies the true relationship between migrant stock and unemployment (Table 21). Specifically, Table 21 shows that for Denmark, Germany, Sweden, and the United Kingdom, migrant stock has a positive relationship with unemployment rate; that is to say, as migrant stocks increase in these countries, the unemployment rates also increase. Specifically, a 1 percent increase in migrant stock is associated with a 0.11 percent increase in unemployment in Denmark, a 1.50 percent increase in unemployment in Germany, a 2.58 percent increase in unemployment in
Sweden, and a 1.01 percent increase in unemployment in the United Kingdom. When taken together, these results show no support for the second hypothesis.

Additional results among the countries where migrant stock was significant show that for Denmark, long-term employment has an inverse relationship with unemployment. In contrast, long-term unemployment in Germany, Sweden, and the United Kingdom have a positive relationship with unemployment rates. For Denmark, Germany and the United Kingdom, GDP per capita has an inverse relationship with unemployment rates: as GDP per capita increases, unemployment decreases. Only Sweden has a positive relationship between GDP per capita and unemployment rate.

As before with the OLS and log-log regression of both GDP per capita and unemployment on the various predictors, it is assumed in Table 22 that the six aggregated destination countries used in the analysis are roughly equivalent, at least with regard to the model variables. Even though this assumption is again being made in the regression equation where average gross monthly wages is the dependent variable, subsequent OLS regressions are conducted to disaggregate the six countries and empirically investigate whether or not this assumption holds for the results present in Table 22.

The overall model in Table 22 is statistically significant. Furthermore, 44 percent of the variation in the dependent variable is accounted for by the five independent variables, suggesting a reasonable model fit. The Normal P-P Plot (see Figure 6) suggests linearity of the variables under regression, thus satisfying the first assumption of regression. The Breusch–Pagan Test was statistically significant, which shows that the model in Table 22 is in violation of the homoscedasticity assumption. The Durbin–Watson statistic suggests a mild to moderate possibility of a violation of the
independence of error terms. Finally, the Shapiro–Wilk statistic was statistically significant, suggesting a violation of the normality-of-errors assumption.  

Table 22

*Unstandardized Coefficients from the OLS Regression of Average Gross Monthly Wages on All Independent Variables for All Six Destination Countries*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE(B)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>-0.12</td>
<td>0.04**</td>
<td></td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>-143.39</td>
<td>30.60***</td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>19.46</td>
<td>7.40*</td>
<td></td>
</tr>
<tr>
<td>GDP per capita</td>
<td>0.06</td>
<td>0.01***</td>
<td></td>
</tr>
<tr>
<td>Policy governing migration (1 = yes)</td>
<td>-265.82</td>
<td>153.01</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>2359.87</td>
<td>416.71***</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.44***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breusch–Pagan Test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>51.02***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$df$</td>
<td>115</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durbin–Watson statistic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$DW$</td>
<td>0.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shapiro–Wilk statistic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$SW$</td>
<td>0.87***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$df$</td>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: *p < .05, **p < .01, ***p < .001, two-tailed tests.*

The results in Table 22 support the third hypothesis. The third hypothesis postulated that higher amounts of migrant stock in the six destination countries would decrease gross wages. Table 22 indeed shows that as migrant stock increases in all six destination countries, average gross monthly wages decrease, net of other factors in the model. The results contained in Table 22 also show that as the unemployment rate decreases, average gross monthly wages increase. Interestingly, a higher long-term...
unemployment for the six destination countries correlates with a higher wage, net of other factors. Finally, Table 22 reveals that as GDP per capita increases, average gross monthly wages also increase.

*Figure 6.* Normal P-P Plot for the OLS regression results contained in Table 22. Dependent variable: Average gross monthly wages over total wages and salaries in cash and in kind, before any tax deduction and before social security contributions.

Table 23 contains the statistical results for the regression of average gross monthly wages on each of the six disaggregated destination countries to check the assumption that all six destination countries can be treated as roughly equal. In addition, the four regression assumptions will again be checked for each of the six disaggregated destination countries. The Normal P-P Plots (see Figure 7) for all six countries suggest linearity of the variables under regression, thus satisfying the first assumption of linearity. The Breusch–Pagan Test was statistically nonsignificant for five of the six countries, which shows that the models in Table 23 for five of the six destination countries, satisfy the homoscedasticity assumption. However, it was violated for Ireland, suggesting the need for a log-transformation of the variables under investigation. The Durbin–Watson statistic for the regression of average gross monthly wages on the predictors for the six disaggregated destination countries ranged from 0.87 to 1.67, suggesting a mild to moderate possibility of a violation of the
independence of error terms. Finally, the Shapiro–Wilk statistic was statistically significant for four of the six destination countries but was statistically nonsignificant for two of the six destination countries, suggesting a violation of the normality-of-errors assumption.\footnote{Given that three of the four regression assumptions are present in the models presented in Table 17, log-transformed regressions are conducted later in this chapter.}

Table 23

Unstandardized Coefficients from the OLS Regression of Average Gross Monthly Wages on All Independent Variables for the Six Individual Destination Countries

<table>
<thead>
<tr>
<th>Variable</th>
<th>Denmark</th>
<th>France</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>$-44.11$</td>
<td>$11.33$</td>
<td>$-1.38$</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>$-345.63$</td>
<td>$120.25$</td>
<td>$-232.99$</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>$75.72$</td>
<td>$50.39$</td>
<td>$12.76$</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>$0.38$</td>
<td>$0.09^{***}$</td>
<td>$0.05$</td>
</tr>
<tr>
<td>Constant</td>
<td>$4395.23$</td>
<td>$3205.13$</td>
<td>$8289.16$</td>
</tr>
<tr>
<td>$N$</td>
<td>$20$</td>
<td>$19$</td>
<td>$20$</td>
</tr>
<tr>
<td>$R^2$</td>
<td>$.69^{***}$</td>
<td>$.59^{**}$</td>
<td>$.36$</td>
</tr>
<tr>
<td>Breusch–Pagan Test</td>
<td>$4.78$ ($p &gt; .05$)</td>
<td>$9.75$ ($p &gt; .05$)</td>
<td>$2.76$ ($p &gt; .05$)</td>
</tr>
<tr>
<td>$df$</td>
<td>$15$</td>
<td>$14$</td>
<td>$15$</td>
</tr>
<tr>
<td>Durbin–Watson statistic</td>
<td>$1.50$</td>
<td>$1.25$</td>
<td>$0.87$</td>
</tr>
<tr>
<td>$SW$</td>
<td>$0.88^*$</td>
<td>$0.85^*$</td>
<td>$0.93$ ($p &gt; .05$)</td>
</tr>
<tr>
<td>$df$</td>
<td>$20$</td>
<td>$19$</td>
<td>$20$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Denmark</th>
<th>France</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>$5.43$</td>
<td>$2.84$</td>
<td>$-14.31$</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>$-116.56$</td>
<td>$52.62$</td>
<td>$148.88$</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>$-29.42$</td>
<td>$29.15$</td>
<td>$-37.17$</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>$-0.02$</td>
<td>$0.04$</td>
<td>$0.06$</td>
</tr>
<tr>
<td>Constant</td>
<td>$5666.70$</td>
<td>$2082.45$</td>
<td>$8087.81$</td>
</tr>
<tr>
<td>$N$</td>
<td>$20$</td>
<td>$20$</td>
<td>$21$</td>
</tr>
<tr>
<td>$R^2$</td>
<td>$.75^{***}$</td>
<td>$.82^{***}$</td>
<td>$.87^{***}$</td>
</tr>
<tr>
<td>Breusch–Pagan Test</td>
<td>$13.32^*$</td>
<td>$2.95$ ($p &gt; .05$)</td>
<td>$3.69$ ($p &gt; .05$)</td>
</tr>
<tr>
<td>$df$</td>
<td>$15$</td>
<td>$15$</td>
<td>$16$</td>
</tr>
<tr>
<td>Durbin–Watson statistic</td>
<td>$1.16$</td>
<td>$1.49$</td>
<td>$1.67$</td>
</tr>
<tr>
<td>$SW$</td>
<td>$.79^{***}$</td>
<td>$.88^*$</td>
<td>$.92$ ($p &gt; .05$)</td>
</tr>
<tr>
<td>$df$</td>
<td>$20$</td>
<td>$20$</td>
<td>$21$</td>
</tr>
</tbody>
</table>

Note: *$p < .05$, **$p < .01$, ***$p < .001$, two-tailed tests.
Denmark
France
Germany
Ireland
Sweden
United Kingdom

Figure 7. Normal P-P Plot for the OLS regression results contained in Table 23. Dependent variable: Unemployment rates by sex, age and nationality, in percentage of active labor pool, aged 15 to 74, both sexes.

As in Table 19, the OLS results in Table 23 suffer from multicollinearity in two countries: Denmark (migrant stock VIF is 13.52; GDP per capita VIF is 14.49) and the
United Kingdom (migrant stock VIF is 12.36; GDP per capita VIF is 18.77). As was the case with the equations in Table 19, both variables were retained despite the multicollinearity problems because they are primary focal variables in the models.

In alignment with the OLS regression results in Table 22, there is support for the third hypothesis in Table 23. Table 23 shows that as migrant stock increases, average gross monthly wages decrease in both Denmark and Sweden. In Denmark, as unemployment increases, wages decrease; however, in Sweden there is a positive relationship between the unemployment rate and average gross monthly wages. In contrast, the long-term unemployment rate has a negative relationship to the dependent variable in Sweden. In other words, as long-term unemployment increases, average gross monthly wages decrease in Sweden. For both Denmark and Sweden, there is a positive relationship between GDP per capita and average gross monthly wages, indicating that as one goes up, so does the other.

Results for the natural log transformation of the independent variables and the dependent variable, which were conducted because of the violations of regression assumptions in Tables 22 and 23, are contained in Tables 24 and 25. As was the case with the OLS regression results in Table 22 above, there is support for H3 in the results contained in Table 24. As migrant stock increases by 1 percent, average gross monthly wages decrease by 0.04 percent in the six destination countries. Similarly, as unemployment rates increase by 1 percent, there is a 0.27 percent decrease in average gross monthly wages. Interestingly, a 1 percent increase in the long-term unemployment

\[ \text{As before with the OLS regression of GDP per capita and unemployment on the various predictors, it is assumed that the six aggregated destination countries used in the log-log regression analysis are roughly equivalent, at least with regard to the model variables. Even though this assumption is again being made in the log-log regression equation presented in Table 18, subsequent log-log regressions are conducted to disaggregate the six countries and empirically investigate whether this assumption holds.} \]
rate is associated with a 0.16 percent increase in average gross monthly wages among all six destination countries. Finally, Table 24 reveals that as GDP per capita increases by 1 percent, average gross wages increase by 0.47.

Table 24

*Unstandardized Coefficients from the OLS Regression of the Natural Log of Average Gross Monthly Wages on the Natural Log of All Independent Variables for All Six Destination Countries*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE(B)$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant stock</td>
<td>−0.04</td>
<td>0.02**</td>
<td></td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>−0.27</td>
<td>0.06***</td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>0.16</td>
<td>0.06*</td>
<td></td>
</tr>
<tr>
<td>GDP per capita</td>
<td>0.47</td>
<td>0.08***</td>
<td></td>
</tr>
<tr>
<td>Policy governing migration ($1 = yes$)</td>
<td>−0.06</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>3.49</td>
<td>0.87***</td>
<td></td>
</tr>
</tbody>
</table>

$N = 120$, $R^2 = .41^{***}$

*Note: *$p < .05$, **$p < .01$, ***$p < .001$, two-tailed tests.*

As was the case in Table 23, Table 25 also has multicollinearity problems in Denmark (migrant stock VIF is 14.187; GDP per capita VIF is 19.058) and the United Kingdom (migrant stock VIF is 13.42; GDP per capita VIF is 18.91). As with Table 23, migrant stock is again associated with a decrease in average gross monthly wages in both Denmark and Sweden. The log-log transformation of the variables allows for a direct examination of effects between the dependent variable and the primary focal independent variable. For Denmark, we see that as migrant stock increases by 1 percent, average gross monthly wages decrease by 2.32 percent, net of other factors. In Sweden, a 1 percent increase in migrant stock suppresses average gross monthly wages by 2.25 percent,
controlling for other variables in the equation. When taken together, the results in Table 25 provides support for the third hypothesis.

Additional results in for Sweden show that as unemployment increases by 1 percent, average gross wages increases by 0.20 percent. A 1 percent change in long-term unemployment in Denmark results in 0.63 percent increase in average gross wages. A 2.78 percent increase in wages is associated with a 1 percent increase in GDP per capita for Denmark; in Sweden, the increase is 0.47 percent.

Table 25

Unstandardized Coefficients from the OLS Regression of the Natural Log of Average Gross Monthly Wages on the Natural Log of All Independent Variables for the Six Individual Destination Countries

<table>
<thead>
<tr>
<th>Variable</th>
<th>Denmark</th>
<th>France</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrant stock</td>
<td>-2.32</td>
<td>-1.53</td>
<td>-0.89</td>
</tr>
<tr>
<td></td>
<td>.65**</td>
<td>1.15</td>
<td>0.61</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>-0.33</td>
<td>-0.89</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>.24</td>
<td>0.31*</td>
<td>0.37</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>0.63</td>
<td>0.07</td>
<td>-0.27</td>
</tr>
<tr>
<td></td>
<td>.22*</td>
<td>0.53</td>
<td>0.42</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>2.78</td>
<td>0.36</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>.70***</td>
<td>0.20</td>
<td>0.26</td>
</tr>
<tr>
<td>Constant</td>
<td>-8.84</td>
<td>18.54</td>
<td>15.04</td>
</tr>
<tr>
<td></td>
<td>5.54***</td>
<td>9.58</td>
<td>5.52*</td>
</tr>
<tr>
<td>N</td>
<td>20</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>R²</td>
<td>.72***</td>
<td>.60**</td>
<td>.27</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ireland</th>
<th>Sweden</th>
<th>United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrant stock</td>
<td>0.29</td>
<td>-2.25</td>
<td>-0.23</td>
</tr>
<tr>
<td></td>
<td>0.16</td>
<td>0.41***</td>
<td>0.26</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>-0.39</td>
<td>0.20</td>
<td>-0.18</td>
</tr>
<tr>
<td></td>
<td>0.11**</td>
<td>0.09*</td>
<td>-0.18</td>
</tr>
<tr>
<td>Long-term unemployment rate</td>
<td>-0.29</td>
<td>-0.18</td>
<td>-0.13</td>
</tr>
<tr>
<td></td>
<td>0.26</td>
<td>0.12</td>
<td>0.17</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>-0.26</td>
<td>0.47</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>0.19</td>
<td>0.13**</td>
<td>0.32*</td>
</tr>
<tr>
<td>Constant</td>
<td>11.21</td>
<td>17.31</td>
<td>2.19</td>
</tr>
<tr>
<td></td>
<td>2.57***</td>
<td>3.03***</td>
<td>1.85</td>
</tr>
<tr>
<td>N</td>
<td>20</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>R²</td>
<td>.83***</td>
<td>.75***</td>
<td>.89***</td>
</tr>
</tbody>
</table>

Note: *p < .05, **p < .01, ***p < .001, two-tailed tests.
CHAPTER VI

SUMMARY

Purpose of Dissertation

While economic factors are not the sole determinants of migration behavior after the fall of the Berlin Wall for the CEE countries to Western Europe, this dissertation supports and adopts the stance that migration is economically driven for the A10 countries under study. This presumptive stance is predicated on the assumption that the predominant motive for migration from A10 countries to Western European countries is a desire among migrants for improved earnings. Thus, the migration decision depends on differential economic opportunities: individuals weigh the costs and benefits associated with migrating. A decision to migrate is influenced by the understanding that the expected benefits must, at minimum, be greater than the expected migration costs. In other words, the larger the expected income differential between the regions or the less expensive it is to move, the greater the number of migrants, ceteris paribus. It is important to note that while there is variability in migration stock in the destination countries under study, migration from the A10 countries to all Western European countries are only a small fraction of the destination countries’ labor migration.

Given these understandings, it should be stated again here that the purposes of this dissertation are as follows: First, to analyze the macroeconomic determinants for, and consequences of labor migration from selected CEE countries, specifically the A8 and A2 (collectively the A10 countries) to the destination countries of the United Kingdom, Ireland, Germany, Denmark, France and Sweden. Within the parameters of the specific period under study (1989 to 2010), this project set about to better understand the
macroeconomic effects of migration on GDP growth, wages, and unemployment, thereby allowing for a comparative analysis of the relative importance of each variable. Second, to focus on emigration from the A10 countries to Western Europe because, as Lemos and Portes (2008) note, the dissolution of the Soviet bloc allowed for a natural experiment under which analysis of migration from CEE countries to Western Europe can take place. After the fall of the Soviet bloc, the A10 countries undertook a more radical and liberal reform trajectory while simultaneously experiencing post-communism state building and development. This process led to EU accession in 2004 for the A8 countries of the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia, and in 2007 for the A2 countries of Bulgaria and Romania. Third, the prevailing theoretical migration conceptualizations used in this dissertation are based on a neoclassical framework that considers the importance of economic incentives in migration decisions. The neoclassical theory puts forth that migration is a response to labor-market disequilibrium which explains, in part, migration from the A10 countries.

Similarly, human-capital theory puts forth that migration and wage differences between the destination and origin country has a positive impact on migration rates. At a given wage difference between the destination and the origin country, the wage level in the origin country is expected to have a positive impact on the decision to migrate to the destination country. For further discussions, see for example, Faini and Venturini (1994), Hatton and Williamson (2002), and Pedersen, et al. (2004).

Research Questions

While the theoretical frameworks may vary, macromigration models are similar in form. The common form for econometric models tries to capture the impact of economic
incentives on countries by relating migration to economic explanatory variables such as GDP per capita, wages, and unemployment. To investigate these empirical issues, two research questions were developed. The research questions and their accompanying formulated hypotheses are set forth below.

Research Question 1: What is the impact of migration on a given destination country’s economic growth (as expressed by GDP per capita) for the six destination countries?

The following hypothesis for Research Question 1 was posited:

\[ H_0 \] Destination country GDP per capita will not be affected by migration from the A10 origin countries, net of other factors.

\[ H_1 \] Destination country GDP per capita will be positively affected by migration from the A10 origin countries, net of other factors.

The data analysis conducted in the previous chapter generally supports the hypothesis associated with the first research question. When all six destination countries are examined as a unit, it was found that migrant stock, average gross monthly wages, and the presence of a policy governing migration positively predict GDP per capita. Specifically, the statistical results indicate that increases in migrant stock were associated with GDP per capita in Denmark, Germany, and the United Kingdom (but not in Ireland, France or Sweden), net of other factors. OLS regression using logarithmic transformation of data found similar results to those obtained above. As noted in Chapter IV, the rationale behind conducting logarithmic transformation of the data in an OLS regression is so regression results can be discussed in terms of their elasticities (Gujarati and Porter 2009). It was found that, with respect to all six destination countries, a 1 percent increase
in migrant stock from the A10 countries led to a 0.05 percent increase in GDP per capita (controlling for other variables in the equation), thereby providing support for the first hypothesis. When the six countries were disaggregated in the logarithmic transformed models, the results for Denmark, Germany, and the United Kingdom again support the first hypothesis. For Denmark, it was found that a 1 percent increase in migrant stock in Denmark results in a 0.70 percent increase in GDP per capita; in Germany, a 1 percent increase in migrant stock was associated with a 1.33 percent increase. In the United Kingdom, for every 1 percent increase in migrant stock, GDP per capita had a corresponding rise of 0.80 percent, net of other factors in the model.

These results are in keeping with the extant literature on migration studies (see for example, Mayda 2010; Bertoli and Fernández-Huertas 2011; Gross and Schmitt 2012) such that migration contributes to the destination country’s economic prosperity. In other words, there appears to be a relationship between migration and GDP per capita in the destination country. The current investigation is in alignment with previous work, insofar as a positive relationship was found between GDP per capita and immigration. While not modeled in this dissertation, it can be argued that the brain drain is in play insofar as migrants’ characteristics, such as education and high skill levels, make a positive contribution on the economic growth of the destination country.

Research Question 2: Does migration create a labor force that enjoys the fruits of its labor in the form of higher wages, or does it generate higher unemployment?

The following hypotheses were put forward to investigate Research Question 2.

$H_0$ Destination country’s unemployment rate will not be affected by migration from A10 origin countries, net of other factors.
H$_{2}$ Destination country’s unemployment will be lowered by migration from A10 origin countries, net of other factors.

H$_{3}$ Destination country’s wages will not be affected by migration from A10 origin countries, net of other factors.

H$_{3}$ Destination country’s wages will be negatively affected by migration from A10 origin countries, net of other factors.

When taken together, the majority of the statistical evidence does not support the second hypothesis. One explanation for these seemingly contradictory results for the second hypothesis lies in the literature itself, as there are conflicting discussions on the impact of migration on the destination country’s economy. As noted previously, some authors (Bauer and Zimmermann 1999; Garson et al. 1997; Dustmann and Fabbri 2003; Hatton and Williamson 2003, 2005a, 2005b) have argued that immigration will increase unemployment and lower wages in destination countries, whereas other authors (Borjas 2003; Cohn 2001; Friedberg and Hunt 1995; Longhi et al. 2009; Mishra 2007; Scheve and Slaughter 2001) and the empirical evidence on the matter (European Commission 2006) suggest that at worst there is no lasting negative effects of immigration on employment or native wages in western European destination countries, and that at best, immigration from CEE countries to western destination countries enhances wage growth and lowers unemployment.

At first blush, the results for all six destination countries suggest that as migrant stock increases, unemployment decreases. However, when the six destination countries were disaggregated, support was found for the second hypothesis. OLS regression results show that in Germany, Sweden, and the United Kingdom, increases in migrant stock
serve to increase unemployment, controlling for other variables. In France, Denmark, and Ireland, there is no relationship between migrant stock and unemployment, net of other factors. In light of the results concerning the relationship between migrant stock and unemployment in Germany, Sweden, and the United Kingdom, the results for all six countries as a whole, with respect to the relationship between migrant stock and unemployment, should be considered a statistical fluke. That is to say, the true relationship between migrant stock and unemployment (controlling for other variables) is most likely the one seen in the disaggregated countries.

The natural log transformations of the variables used to test the second hypothesis gives additional information on the aforementioned relationships. In the logarithmic model it was found that migrant stock was not statistically related to unemployment for all six destination countries. Once the six destination countries were disaggregated in the log-transformed models, it was found that for Denmark, Germany, Sweden, and the United Kingdom, migrant stock increased the unemployment rate. One explanation is that in the aggregated model the differences in the countries that increase the variance are hidden, thereby making the test less sensitive to changes in a country. Disaggregating the overall model allowed for greater sensitivity, thereby leading to the discovered results. Specifically, a 1 percent increase in migrant stock was associated with a 0.11 percent increase in unemployment in Denmark, a 1.50 percent increase in unemployment in Germany, a 2.58 percent increase in unemployment in Sweden, and a 1.01 percent increase in unemployment in the United Kingdom. When taken together, these results show no support for the second hypothesis.
The evidence also suggests that wages are negatively related to immigration, a finding that dovetails with Borts and Stein (1964). Their work states that changes in employment are caused by differential rates of immigration, assuming labor demand is perfectly elastic. Elasticity of substitution, or how substitutable one type of labor is for another, has importance in estimates of the changes in labor supply on wages. The more substitutable two types of workers are, the higher the elasticity of substitution between them. An increase in the labor supply of one type may cause a reduction in wages. If the native and immigrant are not good substitutes, then an increase in labor supply will likely cause a reduction in wages of the other. Indeed, it may increase the wages of the other if the native and immigrant are complements, such that the supply of one type increases the demand for the other.

Card (2001, 2007) compares the wages of native workers with small immigrant inflows to the wages of native workers with large immigrant inflows. This type of research, referred to as an “area approach” finds modest and sometimes modestly positive effects of immigration on the wages of native workers, including those workers with low levels of education. Card (2009, 2) goes on to suggest that if “immigrants and natives in the same skill group are imperfect substitutes the competitive effects of additional immigrant inflows are concentrated among immigrants themselves, lessening the impacts on natives.” However, there are conflicting empirical discussions on the substitution of natives by immigrants. The national approach suggests it is impossible to account for any movement of capital and native-born labor between areas in response to immigration. This suggests that an analysis of the immigration effect on native wages must use national-level data. Indeed, the work of Borjas (2003) tends to use a production function,
estimating the degree of substitution between workers of different skills using national data, and simulates the impact on wages of relative labor supply shifts due to immigration. Aydemir and Borjas (2007), and Borjas, Grogger, and Hanson (2010) each suggest that there are countless elasticities and that equally skilled natives and immigrants are perfect substitutes, whereas Manacorda and Petrongolo (2005) and D’Amuri, Ottaviano, and Peri (2008), Card (2009), and Ottaviano and Peri (2011) suggest there is evidence of imperfect substitution: immigrant and native workers with the same levels of education and experience are not substitutable. Any increase in immigration in skill and education levels may have an adverse effect on the wages of earlier immigrants, since they are direct substitutes or in competition, but have a smaller effect on the native workers with same skill and education.

As previously noted, the third hypothesis postulated that higher amounts of migrant stock in the six destination countries would negatively impact gross wages. An increase in migrant stock in the six destination countries was associated with a decrease in average gross monthly wages, net of other factors. Results for the disaggregated destination countries also provided support for the third hypothesis. As migrant stock increased, average gross monthly wages decreased in Denmark and Sweden, net of other factors. Migrant stock was unrelated to wages in France, Germany, Ireland, and the United Kingdom. Results for the natural log transformation of the independent variables and the dependent variable used to test the third hypothesis also showed support for the third hypothesis. The statistical results found that as migrant stock increased by 1 percent, average gross monthly wages decrease by 0.04 percent in the six destination countries. For the country of Denmark, a 1 percent increase in migrant stock resulted in average
gross monthly wages decreasing by 2.32 percent, net of other factors. In Sweden, a 1 percent increase in migrant stock suppressed average gross monthly wages by 2.25 percent, controlling for other variables in the equation.

There does not, however, appear to be any strong evidence one way or the other concerning the adverse effects of immigration on employment or native wages in the extant research literature that would explain the results obtained in the current investigation. Indeed, the literature suggests that any adverse employment and wage effects of immigration, if they exist, are likely to be small, as presented in Friedberg and Hunt (1995) and Smith and Edmonston (1997), or concentrated to certain segments of the labor force, as discussed in Borjas (2003).

Where migration appears to be responsive to regional differences in unemployment rates, most evidence concerning the reaction of wages to regional unemployment rates in transition countries has been based on three competing approaches: (1) the wage-curve approach, (2) longitudinal variance in data, such that there is a relationship between rate of growth of wages and unemployment, as discussed in Baddeley et al. (2000), and (3) time-series methods. The wage-curve approach is a negatively sloped curve linking wages and unemployment, as discussed in Blanchflower and Oswald (1994), in which the cross-sectional variance in variables is used to assess wage impacts. Where there is less flexibility in wages, the result is usually higher unemployment.

Multicollinearity

Multicollinearity exists when two or more of the predictors in a regression model are correlated. This phenomenon produces moderately estimated standard errors for the
coefficients of a predictor variable (Myers 1986). However, Allison (1999) points out that the presence of multicollinearity, even near-extreme multicollinearity, is not a violation of any of the four primary assumptions associated with the OLS regression model (these assumptions being that of linearity, homoscedasticity, independence of errors, and normality of errors). Allison (1999) notes that the biggest problem associated with multicollinearity is that when independent variables are collinear, it becomes harder to detect statistically significant relationships between independent and dependent variables. As such, multicollinearity is a relatively minor concern in most regression equations, provided that VIFs associated with a coefficient do not rise to extreme levels (Myers 1986; Allison 1999). Indeed, certain types of data are prone to multicollinearity, such as time-series data used in many economic estimations of GDP per capita, wages, migration, and unemployment (Allison 1999). Thus multicollinearity often becomes an artifact of the data one uses, as is the case in the current investigation. That said, it is important to understand that, under multicollinearity, the coefficient of each variable does not represent its contribution to explaining the dependent variable, because other factors cannot be kept constant.

Even though multicollinearity is not an unusual phenomenon in OLS regression, its presence still warrants comment, as the occurrence of collinear independent variables will affect coefficient estimates for those variables that are collinear (Allison 1999). Thus, collinearity diagnostics were conducted as part of the overall regression-analysis framework used in this dissertation. In two instances, collinear relationships were detected as part of the overall regression-modeling process. Specifically, collinear relationships were discovered between the variables migrant stock and GDP per capita,
for Denmark and the United Kingdom in the equations where unemployment was used as a dependent variable and again when wages were used as an independent variable. In those instances when multicollinearity was detected, the VIFs ranged from a low of 7.46 to a high of 24.88. Although these values by themselves do not approach the definition of either extreme or near-extreme multicollinearity, the majority of VIF values discovered as part of the data analyses nevertheless exceed the recommended value of 10 (Myers 1986) and suggest that collinearity does exist between migrant stock and GDP per capita. Hence, the results concerning the regression of both unemployment and average gross monthly wages on the various predictors for Denmark and the United Kingdom should be interpreted with some caution.

Data Limitations

To understand the determinants of migration—that is, (1) higher wages, (2) better employment opportunities, and (3) moving and adjustment costs associated with migration—is to understand the composition and characteristics of the migration process. In the migration literature, this understanding is commonly achieved by estimating bilateral migration flows as a function of characteristics in origin and destination countries (Hanson 2010). However, the current dataset employed by this dissertation project does not allow for this type of analysis. The data used for this dissertation were primarily drawn from published, historical migration statistical information, extracted from the publicly available data sources of EuroStat, the OECD and its affiliated networks, the SOPEMi, and the International Dialogue on Migration database, as well as the ILO. As needed, supplemental data were extracted from CEPII, IndexMundi, the United Nations and its affiliated networks, the UNPD, International Migration Stock, and
the World Bank. Even with the reliability of these sources, incomplete data, especially as it relates to the A10 countries, did not allow for estimations of bilateral migration flow. Thus the lack of bilateral migration data makes it difficult to create a complete economic impact picture in the destination countries. IOM (2003) discusses these and other problems afflicting migration data. As IOM notes, if the data are available, they are usually incomplete, dated, or lacking detail. Such limitations prevent adequate analysis on the determinants of migration and on any socioeconomic changes stemming from migration. Inconsistencies or incompleteness can be a result of different definitions applied, varying reporting mechanisms and making comparable information precipitous at best.

Another limitation in the data is the fact that vestiges of the communist migration registration system are still in use in the A10 countries under investigation. The system was based on a specific definition of a migrant, defined as a documented permanent residence in the country. Salt (2002) confirms that migration data from former Soviet Bloc countries do not lend themselves to straightforward comparison as there is neither a universal definition of migration nor a collection of statistical information for the CEE countries and for Western Europe. Furthermore, as estimation rates may be used from indirect sources, there may be a lowering of the informative power of the analysis when dealing with migration data from former Eastern European countries. Yet, as discussed in Alecke et al. (2001) and Boeri and Brücker (2001), differences in estimation methodologies, modeling frameworks and data samples relating to international migration may lead to different estimates of the migration models’ parameters. Even with the use of the same predictor variables, there may be divergent results. Indeed, as noted
by the OECD (2010, 297), “two questions must be asked before examining stocks of immigrants in OECD countries: 1) Who is considered an ‘immigrant’ in OECD countries, and 2) What are the problems related to international comparability?” In the majority of CEE countries, an emigrant is defined as a person who has declared an intention to leave for another country by deregistration from their permanent residence. This definition does not refer to duration in the destination country. Similarly, many European countries measure migrants as noncitizens, used as a proxy for number of immigrants. There are no separate statistics on foreign born or naturalized citizens being incorporated into the dissertation.

Another limitation is the relatively short time period (1989 to 2010) under review. Hatton (2004) and Lucas (2006) note few EU members report migration flows and stocks for sufficiently long periods. Optimally, calculating net migration rates for regions should be derived from the actual number of immigrants and emigrants over a given time period, with this time period being at least one generation in length. Furthermore, the use of migration stock instead of migration flow prohibits the use of an equivalent measure of migration for origin and destination countries. There is no equivalent measure for migrant stock in the origin country. Additionally, time series of stock data may be compromised by low quality, nonexistent data or data incompatible with that of other nations in the CEE and in the EU (Salt and Clarke 1996). Observations are not independent across time or space, constraining coefficients beyond the intercept to be the same across groups.

Oftentimes, when using time series it is not easy to distinguish between labor migration and nonlabor migration. As labor migration is motivated by economic reasons, inclusion of both labor and nonlabor migrants would result in an underestimation bias and smaller
positive outcomes. However, time-series use may lead to an overstatement of immigration impact. While total inflows and outflows of the foreign population are derived from registers and permits, removal from these lists upon departure is rarer than inclusions, which may have resulted in error in the predictive models constructed in the current investigation.

Country-specific effects of language and culture are important factors when discussing migration. Language can be a means for the self-selection process for the destination country and in the labor force. There is evidence of an increase in immigration when language and culture in the destination country are familiar to the migrant, as discussed in Fassmann and Hintermann (1997), whose work emphasizes that CEE migrants tend to gravitate to the Germanic countries of Austria, Germany, and Switzerland, as German is a prevalent second language. Limited ability to self-advocate in the destination country’s language makes positive societal integration difficult. Massey et al. (1998) suggests immigrants may encounter economic difficulties because some of their capabilities, such as professional or language skills, might not be perfectly transferable in the new society, as they involve acculturation of learning new languages and customs. Moreover, concern about failed integration in destination countries has been one factor that explains the emphasis on language learning for economic and social integration. France, Germany, and the United Kingdom, for example, have measures to promote destination-country language learning for immigrants.

What Should Others Consider?

While there are limitations to the dissertation, it does serve as a starting point for further investigatory projects, especially in light of the fact that migration has been and
continues to be an important component of CEE countries. Migration shapes the European labor market, and that self-same labor market is dependent on the acceptance of immigrants in the destination country. As Sinn (2001) puts forth, East–West migration cannot be explained solely by economic considerations. Nevertheless, EU countries have seen a large influx in immigrants from the rest of the world over the past two decades, which is a trend that seems unlikely to stop (Drinkwater et al. 2003). Even with migration restrictions of quotas and occupational preferences by EU countries, all in place to avoid permanent residence at the destination country, there continues to be a westward movement, especially from CEE accession countries (United Nations World Migration Report 2006). It is beyond the scope of this paper to analyze the time-varying attractiveness of other possible destination countries, such as the welfare benefits or pension designs offered in destination countries. However, Borjas (1987) argues that the earnings of the immigrant population in the destination country may be expected to differ from the native population. Thus, any economic relationships may be viewed as endogenous outcomes of those factors, and should be examined in greater detail by future researchers. To estimate cumulative migration effects over time reflecting the actual effect of past migratory behavior on current migration levels, there may be a wish to examine one year time lag to see if those results are similar to this dissertation’s results.

Furthermore, although it may be reckless to speculate about the future, it is very likely that demographic factors (specifically those of an aging population in EU countries) will increase the demand for immigration, thereby alleviating labor shortages in destination countries. Yet the decision to migrate also depends in part on where an individual is in the life cycle, as measured by age. The older a person, the less likely they
decide to migrate. In fact the relationship should be quadratic. Level of education is a predictor of how likely one is to migrate. Increase in the demand for high-skill levels positively affects international movement of highly educated people. The higher the educational attainment in one’s country of origin, all else being equal, the more likely the individual will migrate (Carrington and Detragiache 1998; Docquier and Marfouk 2004). Therefore any future analysis should include the microeconomic variables of age, education, and skill level.

While the theoretical framework for this dissertation utilizes the neoclassical and human capital theories, it would be of interest to substitute the new household economics of migration theory when continuing this research. Whereas the dissertation assumes a migrant as an individual, the new economic of migration theory posits that migration decisions are not made in isolation but rather by a larger familial unit. Immigrants act collectively to maximize expected income while minimizing risks, thereby diversifying a family’s income source.

In addition to the unmet demand for workers in the destination countries, Korcelli (2000) notes emigration was possible because of the simultaneous existence of political instability pushing migrants out, and liberal immigration policy in Western Europe pulling migrants in. Clearly migration policies are important factors for migration, yet migration polices are not the primary factors to explain any change in migration flows. While evidence exists in the literature to suggest that immigration policies, either restrictive or expansive, have some effect on reducing or increasing migration flows, the overall effect seems to be small when compared to other types of migration determinants, as discussed in Castles (2004), Thielemann (2004), Mayda (2010), and De Haas (2011).
A natural extension of this line of thought would be for future researchers to revisit the hypotheses stated in this investigation, but model them on other Western European countries such as Spain, Portugal, and Italy, or the core of the former Soviet Socialist Republics, Russia. Due to the relatively limited time frame of current study, labor-market conditions have changed in the CEE region in the past two years such that several A10 countries have themselves become destination countries for immigrants from Asia and Africa. Bauer et al. (2004) present evidence that countries that have displayed a relatively fast economic growth, such as the Czech Republic, Hungary, Poland, the Slovak Republic, and Slovenia, now experience positive net migration rates. Future researchers should take this into account when conducting their own investigatory endeavors.

The likely occurrence of tight labor markets in Western Europe could also be used as a framework, suggesting any changes between the CEE and Western Europe are not solely those of wages, but rather employment prospects for migrants to deal with labor-market risks. In contrast, countries that grew less rapidly, such as Bulgaria and Romania, have remained emigration countries (Subhan 1998). However, to the extent that labor productivity and wages in the A10 countries increase with progressing transformation and EU integration, the incentive to migrate to Western Europe may dissipate over time and the number of persons for whom wage differences exceed the costs of commuting and living abroad will decrease. For this reason, more and more people will return to their home countries. These points should also be incorporated into future research projects by investigators wishing to extend the line of thought advanced by the current project.
Future researchers may also want to discuss the role of having secured employment in the destination country prior to arrival. Indeed, Lundborg (2013, ii) offers that most empirical studies on wage effects of immigration disregard common labor-market institutions like the requirement of job offer before entry to the host country and wage bargaining, concluding that wage effects of migration should focus on the unassimilated rather than assimilated immigrant. The unassimilated immigrant tends to have low reservation wages, whereas after-assimilation wages return to original levels. Indeed, the migration discussion could be extended to temporary programs, specifically that of the seasonal worker. The seasonal worker is a large category within the migration discussions. Yet, there is “a dearth of rigorous evidence on development impacts of seasonal migration” as Gibson and McKenzie (2010, i) suggest.

Lastly, where this dissertation uses a unilateral migration direction, the use of a combined time-series and cross-sectional model of bilateral migration may evidence different outcomes of migration relationship than was evidenced in this dissertation between origin and destination countries. Indeed, Kielyte and Kancs (2002) find, for the Baltic states, migration to the EU increased in the destination country’s income relative to the origin country’s income and immigration stock. The use of a pooled time-series and cross-sectional model of bilateral migration flows from the Baltic States to the EU might be fruitful for future investigatory endeavors, as researchers may find that migration increased in the destination country’s income relative to the origin country’s income, and in the stock of existing migrants from the Baltic States to the EU.

Others may wish to consider directionality effects of GDP per capita, unemployment and wages. In other words, does higher GDP per capita, for example,
attract more migration or does migration lead to higher GDP per capita in the destination country. The same reciprocal relationship can be said of unemployment and wages.
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