

ABSTRACT

Title of thesis: INVESTIGATING THE GLOBAL PRODUCTIVITY
EFFECTS OF HIGHLY SKILLED LABOR
MIGRATION: HOW IMMIGRANT ATHLETES
IMPACT OLYMPIC MEDAL COUNTS

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Labor migration is a defining attribute of today's global economy, as more people live outside their country of birth than ever before and workers have more opportunities beyond their local borders (GCIM, 2005). This has motivated scholars to better understand the mobility of human capital and its various effects. While data are available to track aggregate migration patterns between countries, it is much more difficult to determine its association with such metrics as gains or losses in productivity for specific sectors of industry (Asis & Piper, 2008). Athletes are among the few groups of workers (along with information technology specialists, senior academics, health professionals and teachers) who can seek employment on a global market level while most people have fewer opportunities based on national markets (GCIM, 2005). Moreover, given the availability of records and clear metrics of productivity, the sports entertainment industry provides a unique opportunity to investigate the movement of a highly

skilled labor force (Kahn, 2000). Therefore, the current study will investigate 21st century labor migration patterns and their relationship to productivity in the context of arguably the largest, oldest and most global example of sports business, the Summer Olympics. The scholarly and practical implications and future directions for research will be discussed.

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OLYMPIC MEDAL COUNTS

by

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Chapter I: Introduction

The transient nature of labor forces has become progressively more commonplace in today's global economy. With more people living outside their country of birth than ever before, the increasing scope and frequency of labor migration presents complex opportunities and challenges for affected nations and people, which have brought about concomitant interest of researchers across various disciplines (Asis & Piper, 2008; Bandyopadhyay & Wall, 2008; Doyle, 2005; Taylor, 2005). The transnational movement of skilled labor in particular increased more than eightfold from 1960 to 1990, and countries have subsequently struggled to balance immigration policies designed to reap the benefits brought by an influx of skilled migrants, while simultaneously dealing with the loss of indigenous talent (Donaghey & Teague 2006; Kanbur & Rapoport, 2005; Oettl & Agrawal, 2005; Spencer, 2002). As a consequence "brain gains" (an increasing level of human capital), "brain drains" (a net loss of human capital), and "brain exchanges" (a flow of human capital resulting in no net loss or gain) take place across borders throughout the world and affect the involved countries' resources and productivity (Straubhaar, 2000). However the

Global Commission on International Migration (GCIM, 2005) notes that while labor migration is ubiquitous, relatively few types and motivations for labor migration can be considered global. Because of their unique skill sets, athletes and entertainers are among the minority of labor forces (along with information technology specialists, senior academics, health professionals and teachers) who can seek employment on a global market level, while the majority of people have more limited opportunities based on national markets (GCIM, 2005). As a result, Asis and Piper (2008) argue that few studies have examined the impact of migration on a global level. They note that most migration studies are conducted at either the origin or destination country but rarely as interacting units or from a region-wide perspective.

Because of the global nature of the sports entertainment industry and the omnipresence of elite athletes, Kahn (2000) and Torgler (2009) asserts that the sports industry offers a medium through which to study skilled labor migration and provides a virtual laboratory to test implications of labor market theories. There exists a global market for athletes, who have many of the same motivations for migration as other labor forces. Sport represents one of the biggest industries in the world, and the availability of statistics on the performance of individual athletes and relatively straightforward measures of productivity help to facilitate development of models explaining and predicting worker productivity. One of the largest and most international sports business venues is the Olympic Games. The upcoming Summer Olympics in London in 2012 will operate with a budget of more than 7 billion GBP (BBC, 2010). NBC paid a record \$2.2 billion for the

American broadcast rights to the 2010 and 2012 Olympics, 5,500 times more than what the television rights were first sold for at the 1960 Olympics (Serjeant, 2010; McMillan, 1991). Milton-Smith (2002) argues that the modern Olympics have always operated as a business and that even the ancient Greek Olympics utilized a professional labor force of athletes. Thus, despite rhetoric to the contrary, the Olympics have many of the qualities of modern professional sports, and today professional athletes compete in the Games that originated exclusively for amateurs. As will be illustrated, athletes who have switched nationalities and competed for other countries can be considered a migrating labor force, and the policy to deal with this form of capital mobility has been inconsistent as governments and non-governmental organizations attempt to balance the benefits and challenges athlete immigration poses in this area of the sports industry. Like labor migration in other sectors, the relocation of Olympic athletes has the potential to provide competitive advantage to some while putting others at a disadvantage, and it is difficult (arguably impossible) to regulate fairly (Carlson, 2004; NBC Sports, 2004, "Citizenship Rules in the Olympics", Vol. 1, p. 82). The Olympics represent possibly the most global context for understanding sport labor migration by virtue of the fact that more countries participate than in any other sporting event in the world; yet, to date, few studies exist in this area. Consequently, the current research builds on the growing literature on labor migration and productivity by investigating the global flow of a particular group of highly skilled workers (Olympic athletes) across international borders to assess

the effects of human capital mobility on productivity (medals) in one of the largest and most competitive sectors of the sports entertainment industry.

The productivity of the athlete labor force in the Olympic Games can be evidenced in a variety of ways. Just by being part of the competition, the athletes provide compelling television content, which helps increase advertising and sponsorship revenues. Winning medals can help garner worldwide attention for the nations that they represent. Athletes of foreign origin can contribute to the medal totals of their new countries and to the material (e.g. advertising revenue, donations, heightened public attendance and awareness of sport) and symbolic effects (e.g. national pride, international prestige) that are purported to accompany winning Olympic medals (Hilvoorde, Elling and Stokvis, 2010; Delgado, 2003; Moosa & Smith, 2004). As a corollary, the nation that the winning immigrant athlete is originally from is often unacknowledged and unaccounted for in the medal standings, akin to the “brain drain” found in other sectors – what Wharton (2004) termed “brawn drain” – whereby some countries lose their valued, natural athletic talent to others. The symbolic benefits of winning a medal can be elusive and are difficult to quantify but seem to be sought after given the amount of money countries allocate to achieving Olympic success and winning medals (Vinokur, 1988; Koller, 2008; Hilvoorde et al., 2010). For instance, in 2006 UK Sport estimated that the cost per year to train a single British Olympic athlete for the 2012 Summer Games (with no guarantee of medal success) is 93,000 GBP plus an additional 70,000 GBP per year if the athlete has potential to win a medal. Using these estimates and the projected size of its Olympic team, each medal

Great Britain anticipates to win in 2012 will cost at least 10 million GBP in total (Jenkins, 2006). As discussed later, migration can also provide benefits to the individual athletes, and from their perspective, winning medals can open doors to personal and commercial opportunities (Zuckerman & Hauptly, 2008). Unlike other highly skilled professions, however, the physical demands of competitive sports at elite levels means that athletes generally have a more limited window of opportunity to maximize the benefits of their talents; moreover, the Olympics offers its competitors a chance to “produce” only once every four years.

Academic studies have investigated the effects of population sizes and economic factors such as GDP per capita on countries’ medal counts (Johnson & Ali, 2004; Rathke & Woitek, 2008) but have yet to attempt to quantify the contribution of human capital in the foreign-born medal winners to their new countries’ medal totals. International Olympic Committee (IOC) president Jacques Rogge noted in 2004 that he disapproves of “flexible citizenship” (Ong, 1999). “From a moral point of view, we should avoid this transfer market in athletes,” he said. “What we don’t like is athletes being lured by large incentives by other countries and giving them a passport when they arrive at the airport” (Rogge, in Carlson, 2004, p. 4). However the IOC does not collect or have the information to track the migration of athletes (such as birthplaces and timing and motivations for migration) and hence no way to monitor labor migration patterns and effects. Labor migration within the Olympics has received little critical evaluation. The availability of data and statistics to answer research questions remains a challenge to understanding migration issues and formulating policies

that address the ramifications of migration (Asis & Piper, 2008). Thus the current study investigates: 1) athletic talent flows across borders as an example of skilled labor migration and capital mobility (Oettl & Agrawal, 2008); 2) the global productivity effects of elite immigrant athletes in a global sports competition (Milton-Smith, 2002; Hilvoorde et al., 2010; Asis & Piper, 2008); and 3) whether the presence of foreign-born talent offers organizations (i.e., national Olympic teams) a competitive advantage in this realm.

Chapter II: Literature Review

The sports industry offers researchers a unique opportunity to investigate labor market theories given the availability of individual performance statistics for workers, relatively well-defined metrics of productivity and comparison (win, score), and clear outcomes (Kahn, 2000; Munasinghe, O’Flaherty & Danninger, 2001; Moskowitz & Wertheim, 2011). In addition, sport represents one of the largest and most globally ubiquitous businesses in the world. The current study focuses on the Olympics, as it provides a global context for examining highly skilled labor migration. The Olympics illustrate how gains and losses of productivity can be affected by the migration of elite athletes (Hilvoorde et al., 2010). The research will first be framed by a review of the relevant labor migration literature, followed by a discussion on sport labor migration in general and how this issue relates to the Olympics in particular.

Labor Migration

The movement of people as referred to by Appadurai (1990) as “ethnoscapes” and their external effects represent a form of capital mobility as today’s global economy facilitates the flow of people across borders with greater ease than at any time in history. In 2005, an estimated 200 million people lived outside their country of birth, an increase of 25 million from 2000 figures and more than ever before. Approximately one in thirty-five people, or 2.9 percent of the world’s population, were international migrants in 2005 (GCIM, 2005). From 1990 to 2000, international migration explained 56 percent of the population

growth in the developed world (including 89 percent in Europe) compared with 3 percent in the developing world (GCIM, 2005). Labor migration and its effects have received significant research interest among social scientists since the 1960s; in particular, Hewlett (2002) notes that scholars across various disciplines such as business, economics and sociology have focused on exploring the determinants and consequences of labor migration. Early research emphasized motivations for migration, and more recent studies have increasingly addressed migration's effects (Hewlett, 2002).

Skilled migration represents a subset of labor migration (Kanbur & Rapoport, 2005), and the movement of this talented labor force has increased more than eightfold since the 1960s (Kanbur & Rapoport, 2005). A worldwide market exists for certain professions such as information technology specialists, senior academics, health professionals, teachers and athletes (GCIM, 2005). Appadurai (1990), Doyle (2005), Bandyopadhyay and Wall (2008) are among several scholars who reference (skilled) immigration's impact on defining today's economy. At one time skilled workers may have been limited to local resources and opportunities. Now their influence has a potential to project far beyond their native borders and regions. For example Doyle (2005) illustrates how a Nigerian computer engineer can extend his influence to Sweden because of the ease of travel and communication and the financial and technological interdependence that are products of contemporary globalization.

While there are certain types of involuntary migration (e.g. refugees and asylum seekers), voluntary migration is a selective process with migrants

choosing the optimal destination countries, and destination countries screening for the optimal migrants (Kanbur & Rapoport, 2005). Better opportunities, rational individual choice, and utility maximization – often caused by wage disparities, unemployment rates, differentials in life expectancy and education gaps – motivate voluntary labor migration (Doyle, 2005; GCIM, 2005; Hewlett, 2002).

With regard to the study of migration's effects, Hewlett (2002) notes that the existing literature has focused on market efficiency and externalities associated with either gross migration (a single flow from one location to another) or net migration (the aggregate of inflows and outflows). In 2000, 86 million of the world's migrants (more than 50 percent) were economically active (GCIM, 2005). Skilled migrants and their families comprised more than 50 percent of immigrants entering Canada, Australia and New Zealand (GCIM, 2005). However, labor migration researchers face challenges in accurately assessing the effects skilled migrants might have on productivity at a global level given the difficulties in obtaining the requisite data to adequately test this assumption (Asis & Piper, 2008). Oettl and Agrawal (2008) measured the productivity of skilled migrants using patent citations connected with the flow of inventors and knowledge across borders. They examined the dataset compiled by the United States Patent and Trademark Office and looked for identical inventor names with patents registered using addresses in different countries. Countries with a net gain of inventors were labeled "importers" and countries with a net loss of inventors were labeled "exporters." They found, over a 20-year period (1980 to 2000), a 1.2-percent frequency of patent citations attributed to immigrant inventors.

Countries varied substantially in their inflow and outflow of inventors. Of the 26 countries in their sample, the United States, Japan, Germany and Great Britain accounted for more than half of the inflows of inventors and also more than three-quarters of the outflows of inventors. The United States, with more “imported” inventors than “exported” was classified as a “net importer,” while Japan and Germany were “net exporters” and Great Britain showed a balanced level. However, lack of available data to track migration prevented Oettl and Agrawal (2008) from knowing motivations for migration or exactly when migration occurred; thus they offer conservative conclusions and call for more research about productivity effects of labor migration on a global level. Others have also cited data limitations as the biggest challenge to modeling labor migration patterns and effects (Asis & Piper, 2008).

On a local level, a specific analysis of intraregional movement by workers in Swedish labor markets found that higher levels of labor mobility contribute to greater knowledge diffusion, productivity and efficiency (Thulin, 2009). Mobility facilitates exposure of workers to other workers and resources, and it leads to better matches between employees and employers (Thulin, 2009). Quality-selective immigration policies have contributed to increased levels of highly skilled migration over the past 20 years, which in turn positively affect productivity, according to International Labor Organization (ILO) statistics (Kanbur & Rapoport, 2005).

Labor Migration Policy Tensions

The study of immigration and assimilation policies has been cited as one of the most recent and relevant public policy issues that can inform the policy sciences discipline (deLeon & Vogenbeck, 2007). In their history and calls for the future directions of policy sciences, deLeon and Vogenbeck (2007) explain how policy evaluation serves the historical paradigmatic function of advisor to ruler. Since the discipline was first articulated by Harold Lasswell in 1951, policy sciences has investigated social, political and economic issues through systematic and rigorous study that is multi-disciplinary, contextual and problem-oriented, and normative (deLeon & Vogenbeck, 2007). While the war on poverty in the United States in the 1960s, the Vietnam War, the energy crises in the 1970s, and the end of the Cold War guided initial policy sciences research, deLeon and Vogenbeck (2007) have called for globalization, terrorism, genetic engineering and biotechnology, robotics, information policy, and immigration and assimilation policies as new policy areas to be studied to inform the administrative and political community.

In this light, the pros and cons of international and national labor migration policies have been debated in the academic literature (Kanbur & Rapoport, 2005). Some have argued that the optimal immigration level gains from migration outweigh the costs (Bandyopadhyay & Wall, 2008; Thulin, 2009) and that it has a positive effect on a country's bottom line (Spencer, 2002; Straubhaar, 2000). The New Growth Theory (Straubhaar, 2000) proffers a positive evaluation of immigration in the context of the host country based on the

contributions of imported human capital (both quantifiable and externalities) outweighing assimilation costs. In Great Britain, Home Office research concluded that migrants contribute 2.5 billion GBP more to the public purse each year than they consume in public services and welfare benefits (Spencer, 2002).

On the other hand, rationales for immigration control have included: 1) preserving national culture; 2) defending liberal values and the rule of law; 3) protecting the economic and social rights of citizens; 4) giving meaning to democracy; and 5) the expense of the (developing) country that has educated, trained and then lost the migrants (Taylor, 2005; Spencer, 2002; Hewlett, 2002; Donaghey & Teague, 2006). In addition, Bandyopadhyay and Wall (2008) reference immigrant assimilation costs for destination countries, in order to incorporate them into the domestic workplace, to adapt socially and to be responsible citizens. Consequently, migration has become a concern for an increasing number of countries of origin, transit and destination because it touches on many corollary issues, including labor shortages, unemployment, worker remittances, human rights, refugee/asylum crises, social integration, xenophobia, illegal migration, human trafficking, and national security (Doyle, 2005).

From an international perspective, a desire exists for international cooperation, although no organization has the broad mandate to dictate labor migration policy on a global level (Doyle, 2005). Donaghey and Teague (2006) specifically explain some difficulties the European Union has encountered with regard to labor migration. From a national perspective, nations have acted independently and in their own interests, such as the different national policies of

European Union countries examined by Donaghey and Teague (2006) in light of the unified European Union policy about open immigration. Many European Union nations, such as Austria, Germany and Italy, initially chose to retain their national policies controlling migration. Immigration policies in many Western countries, such as screening, point-systems favoring educated migrants, and visa programs to raise the number of skilled professionals and highly educated migrants, have facilitated and attracted skilled labor migration (Kanbur & Rapoport, 2005; Taylor, 2005). Optimal policy with regard to labor migration is promoted as including openness, standard setting, and cooperation (Donaghey & Teague, 2006; Taylor, 2005; Doyle, 2005). Spencer (2002, p. 224) concludes that labor migration is “here to stay.” It brings many benefits and challenges; it “can be managed but not prevented” (Spencer, 2002, p. 225). Because of the costs and benefits labor migration presents, Asis and Piper (2008) note a discrepancy between international and national agendas regarding immigration and call for future research in this area. Given the global market for athletes, the related policy issues associated with athlete migration, and the relative availability of data to analyze their mobility, the sport entertainment industry offers a venue to analyze migration patterns and productivity effects.

Labor Migration in Sports Entertainment Industry

Torgler (2009, p. 333) argues that sporting events can be viewed and studied as “economic (miniature) environments.” Economic concepts such as opportunity costs, prices and property rights are observable in sporting contexts. An advantage of investigating economic theories within sports is that sport offers

controlled environments where participants operate under similar rules and conditions and are motivated by general economic principles such as incentives and constraints. Sport provides a wealth of reliable data with low variable errors and where the metrics of productivity are relatively clear (Munasinghe et al., 2001; Torgler, 2009). Munasinghe et al. (2001) argues that, although some might object to sport as a central economic activity, it is at its core a human endeavor in the same way that writing software is. While it is not always clear who is “better” at writing software, sports records are more clear about what “better” means, how productivity can be compared, and whether records are being broken faster (Munasinghe et al., 2001). Kahn (2000) found this to be the case when examining labor migration theories. In addition, the study of sport offers a window into examining a global, multi-billion dollar business.

Elite athletes represent a particular type of human capital and offer an example of highly skilled labor (Shmanske, 1992). In fact, athletes comprise one of the few global labor forces cited by the Global Commission on International Migration (GCIM, 2005). Athlete migration is analogous to the export of raw materials because the athletic talent from one country can be utilized by another country (Poli, 2006). Professional sports leagues routinely employ an immigrant work force, such as European players in the National Hockey League (NHL), Hispanic and Japanese players in Major League Baseball (MLB), and African players in the English Premier League (EPL) and other European soccer leagues (McCormick, 2004). Immigration policies and legal decisions such as the 1995 Bosman ruling in the European Court of Justice allowing the free movement of

workers at the end of their contracts have facilitated the increased athlete labor migration (McCormick, 2004).

To this end, a small body of “sport labor migration research” – a term from the title of a theoretical paper by Joseph Maguire (2004) – has been carried out in certain international sporting contexts such as soccer, cricket and handball (Poli, 2006; Stead & Maguire, 1998; Agergaard, 2008). Unlike much of the labor migration literature on other sectors, these studies rarely attempt to model the productivity effects of player movement. They instead tend to postulate motivations for their migration, such as financial, personal or talent development, without empirical testing (Maguire, 1996; Magee & Sugden, 2002). However one of the few exceptions in this area is research in the field of economics that has modeled intra-league migration within MLB, where data on player movement and productivity are readily available (Cymrot & Dunlevy, 1987; Cymrot, Dunlevy & Even, 2001). These studies illustrate how migration by “free agents” is motivated by expected earnings gains. However, this research focuses on intra-league (and not international) movement of athletes between teams. The relative availability of archival data in professional baseball makes it easier to track intra-league labor movement (via records of transactions between teams and players) and subsequent productivity metrics (e.g. player statistics), as opposed to obtaining and pairing similar data related to global migration. As for some studies that have attempted to quantify migration in international sport (inter-league as opposed to intra-league), Poli (2006) examined the number of players of African origin competing in European soccer leagues during the 2002-2003 season. Similarly,

Agergaard (2008) tallied the number of foreign players in the Danish Women's Handball League. The above research begins to detail the global labor market of athletes. However these studies lack a truly global dimension and instead focus on specific countries and regions. Few, if any, sport labor migration studies have attempted to model migration and its effects on productivity on a global level.

The Global Nature of the Olympic Games

Perhaps the most global example of the sports business industry is the Olympics, in which more countries participate than any other athletic venue. The fact that the 2008 Summer Olympics featured competitors from a record 204 countries or territories (a larger collection than the United Nations) makes the Summer Olympics arguably the most global business enterprise in the world. The International Olympic Committee (IOC) represents one of the largest and most powerful sport business organizations in the world. The "Olympic mystique" has become highly sought after by countries looking to host the Olympics and/or cash in on Olympic success and by corporations and sponsors seeking to partner with the Olympic aura (Barney, Wenn & Martyn, 2002). In the 1970s, Lord Killanin, president of the IOC from 1972 to 1980, recognized that commercial revenue is the "glue" that would maintain and grow the Olympic movement, in contrast to his predecessor's bemoaning the infusion of commercial motivations into Olympic affairs (Barney et al., 2002, p. 275).

Today many countries devote substantial resources to the pursuit of Olympic medals (or more precisely to the previously mentioned corollaries that accompany winning a medal). Some studies have tied success (or failure) in the

medal standings to levels of national self-confidence and unity and perceived international prestige (Allison & Monnington, 2002; Hilvoorde et al., 2010). For example, the 1985 Coe Report in Great Britain cited that Olympic medal success makes citizens proud of their national identity, improves a country's image abroad (which facilitates selling national products), and increases participation in sport and recreation (leading to health benefits) (Moosa & Smith, 2004). The pursuit of success in elite sports to meet national and international prestige goals has been referred to as "sportive nationalism" (Hoberman, 1993; Bairner, 1996; Koller, 2008). Countries investing in the Olympics expect a return on their investment (Allison & Monnington, 2002; Shibli et al., 2008). In some countries (such as Great Britain, Russia and Germany) investment in Olympic training and success is funded and operated by public, governmental entities. In other countries (such as the United States) Olympic bodies are private organizations. Regardless of whether the "sportive nationalism" is publically or privately controlled, Koller (2008) argues that all governments have a vested interest in Olympic success (and its corollaries). Even the private endeavors take advantage of government policy (such as immigration) that promotes Olympic success. Allison and Monnington (2002) provide an example of how the United Kingdom and France allocate funding to elite sport based on medal probabilities. Baruch et al. (2004) note that even an arguably collectivist culture, China, implemented a performance-related pay (PRP) program in 1985. Baruch et al. (2004, p. 250) attribute this to the country's rise as an Olympic power and the importance placed on the Olympics, which President Jiang Zemin described as the "glory of the motherland and pride

of the people.” Failure to meet expectations can have political consequences (Hilvoorde, Elling & Stokvis, 2010). After Russia failed to win as many medals as it had anticipated at the 2010 Winter Olympics, Russian President Dimitry Medvedev called for the resignation of the country’s top sports officials. Russian officials said they spent about \$25 million per year to prepare athletes for the 2010 Winter Olympics. Medvedev called Russian Olympic federation leaders “fat cats.” However the country’s sports minister responded, “This is sports. Such negative results should not be viewed as national humiliation” (quoted in Boudreaux, 2010).

The importance placed on winning medals has sparked economic studies that have developed production functions and efficiency analyses that show how economic, non-sporting variables such as population size, GDP and form of government correlate with medal distribution (Johnson & Ali, 2004; Moosa & Smith, 2004; Rathke & Woitek, 2008). These studies seek to determine the economic and political determinants that allow some nations to be more productive in terms of medals won than other countries. Johnson and Ali (2004) examined countries’ participation and medal totals after World War II in connection with economic and political determinants they believed would be related to participation and productivity: GDP, population size, whether a nation hosts or is in proximity to the site of the Games, political regime and climate. Regression analyses by Johnson and Ali (2004) suggest that larger, high-income nations have an advantage in terms of participation and winning medals. One in three competitors at the 2000 Summer Games and one in two at the 2002 Winter

Games came from countries ranked in the top 10 percent of GDP. Nations hosting or near the site of an Olympics also were found to have a competitive advantage. Single-party or communist political systems were more productive than democracies or republics. At each Summer or Winter Games since 1952, there has been an average of nine to thirteen competitors per medal. Less than half of the countries that participate in the Olympics actually win medals. They estimate that each additional medal won is equated with a \$1,760 increase in GDP per capita, with additional gold medals estimated at a \$4,750 increase in GDP per capita (Johnson & Ali, 2004). The variables they use to predict medal counts had a total explanatory power of $R^2=.47$. Rathke and Woitek (2008) also find that GDP and population are related to medals won but that population is a significant predictor only for relatively rich nations. The emphasis and resources placed on winning Olympic medals seems to contrast with the Olympic creed of modern Olympic founder Baron Pierre de Coubertin, “The most important thing in the Olympic Games is not to win but to take part, just as the most important thing in life is not the triumph, but the struggle. The essential thing is not to have conquered but to have fought well” (Mallon & Buchanan, 2006, p. 210).

As another illustration of Milton-Smith’s (2002) argument that the Olympics operate in much the same way as other sports business ventures, migration has become a feature of the Olympics as it has in professional sports leagues mentioned earlier. In their survey of the Olympics’ effects on citizens’ national pride in the Netherlands, Hilvoorde et al. (2010) suggested (but did not measure) that the externality of Olympic medals won by athletes of foreign origin

contributes to the medal totals of the immigrants' new countries. The immigrant country benefits in the medal tables, while the emigrant medal winner's country of origin cannot effectively take advantage of the recognition that accompanies that Olympic success. Medal studies have yet to look at whether external human capital in the form of migration levels (in other words, the input of foreign labor) is related to medal productivity.

Motivations for Migration in the Olympic Games

In line with the tenets of benefits prompting the push and pull of skilled labor across international borders (Doyle, 2005; Hewlett, 2002) and some of the specific financial and personal development motivations suggested for sport labor migration (Maguire, 1996; Magee & Sugden, 2002), there seem to be at least four motivations that help explain athletes' migration in the modern Olympics: 1) a desire for a better quality of life outside of sports (e.g. catalyzed by political, financial or marital motivations); 2) a desire to compete (e.g. if they are unable to qualify for their native national team); 3) a desire to win (e.g. in search of better coaches and facilities, especially in team sports where an athlete's country of birth may not even field its own team); and 4) a desire for financial benefits resulting from a newer phenomenon that involves a country recruiting athletes of other nationalities for purely competitive reasons in hopes of boosting the new country's athletic profile through international sports events (Carlson, 2004; Thibault, 2009). Some of the notable anecdotes of labor migration in the Olympics that have been highlighted in media coverage suggest a variety of motivations and a variety of countries involved.

Some athletes seek a better life catalyzed by political, financial or marital motivations. For example, Nastia Liukin, who won four individual medals and one team medal in gymnastics for the United States in 2008, was born in Russia and immigrated with her parents to the United States as a young girl after the breakup of the Soviet Union. Liukin's father, Valeri Liukin, won four gymnastics medals while competing for the Soviet Union in the 1988 Olympics.

Others might change nationalities if they are unable to qualify for their native national team. For example, Becky Hammon, born in the United States, was unable to make the U.S. women's basketball team and instead helped Russia to a bronze medal as its leading scorer at the 2008 Games. Hammon has no ancestral ties to Russia and was granted Russian citizenship because she plays there professionally and has never competed for another country in an event sanctioned by basketball's world governing body, FIBA. She told ESPN.com, "The jersey that I wear has never made me who I was. It has nothing to do with what's written on my heart. Will I be playing for Russia? Yes. But I'm absolutely 100 percent still an American. I love our country. I love what we stand for. This is an opportunity to fulfill my dream of playing in the Olympics" (Drehs, 2008). Hammon's case shows how contemporary labor migration features a flow from the United States to Russia that might not have been possible thirty years ago given the historical tensions between the countries.

Athletes can also be drawn to new countries in search of better coaches and facilities, especially in team sports where an athlete's country of birth may not even field its own team. For instance, Natasa Janics was born in Serbia and

finished fourth in 2000 in women's kayak singles for Serbia and Montenegro as the only female kayaker ever to compete for the country (whether the country was under Yugoslavia, Serbia and Montenegro, or simply Serbia). She then moved to neighboring Hungary where she won one individual and three team medals in 2004 and 2008. Athletes will also train and live in another country while still competing for the country of their birth, such as Zimbabwe swimmer Kirsty Coventry and Tunisian swimmer Ous Mellouli, who train in the United States and were their respective country's only medalists in 2008.

A newer phenomenon involves a country recruiting athletes of other nationalities for purely competitive reasons in hopes of boosting the new country's athletic profile through international sport events (Carlson, 2004; Thibault, 2009). For example, the Qatar Olympic Committee recruited eight Bulgarian weightlifters to change their citizenship and compete for Qatar at the 2000 Olympics. Said Saif Asaad, who changed his name from Angel Popov, won bronze (Blustein, 2004). The only other medal Qatar has ever won was in 1992 by Somali-born Mohamed Suleiman. The brief examples listed above seek to demonstrate the range of motivations and flows of labor migration in sports, which are in line with the Global Commission on International Migration's treatment of athletes and entertainers as one of the few truly global migrating labor forces (GCIM, 2005). Both high-income and low-income nations have received productivity from immigrant athletes. Importing talent has allowed some low-income nations (e.g. Togo) to compensate for economic disadvantages cited by Johnson and Ali (2004) (i.e. fewer resources to devote to developing

homegrown talent).

However because of both intense physical and competitive demands, athletes have a limited time frame to capitalize on their talent and benefit personally and financially from their skills. Just like free agency has allowed athletes in professional leagues to move between teams, such is also the case with the Olympics, despite the perception of loyalty to one's country in international competition (Hoberman, 1986; Maguire and Bale, 1994). National pride does not necessarily trump financial and personal motivations when representing one's country in international sports.

IOC Policies on Athlete Labor Migration

Unlike intra-league movement, such as migration within MLB (Cymrot & Dunlevy, 1987; Cymrot, Dunlevy & Even, 2001), it is arguably more difficult to track the movement of athletes for the Olympics since the IOC does not compile this data, which seems at odds with IOC president Rogge's remarks, cited earlier in this paper, about curbing the number of athletes who switch their citizenship to compete for a new country in the Olympics. Thus there appears to be a contrast between the rhetoric and actions of the Olympic governing body. As shown later, despite trying to suggest a message of wanting to control migration in the Olympics, the IOC and certain NOCs have reaped the benefits of labor migration.

Migration policy issues in the Olympics are not new phenomena. For instance, the Soviet Minister of Sport proposed allowing athletes who were from nations planning to boycott the 1980 Summer Olympics to compete as individuals under the Olympic flag. Peter V. Ueberroth, president of the Los Angeles

Olympic Organizing Committee, made a similar suggestion before the 1984 Olympics (Hoberman, 1986). The IOC promptly rejected both proposals. Nevertheless South African runner Zola Budd circumvented this ruling by applying and summarily being granted British citizenship because she had a British-born grandfather. In light of contradictory policy when it comes to dealing with Olympic migration issues uniformly, Hoberman (1986) cites “the IOC’s political dexterity (or timidity)” due to the “infinitely flexible regulation” of citizenship outlined in the Olympic Charter. Indeed Milton-Smith (2002) calls for Olympic policy to be refocused and made relevant to the 21st century. In discussing the business ethics of the IOC, Milton-Smith (2002) argues that winning at all costs, commercial exploitation, national rivalries, cheating, cronyism and corruption overshadow the social and ethical good of the Olympic aura promoted by the IOC.

In addition to the IOC’s concerns, certain nations have been resistant to the free movement of their native athletes to compete for a different country. For instance, Croatia paid Bulgaria the equivalent of \$100,000 for the rights to weightlifter Nikolai Peshalov, who had won two medals for Bulgaria in 1992 and 1996 before winning two more for Croatia in 2000 and 2004. This is in addition to the money Croatia paid Peshalov himself. Peshalov’s case is interesting because it puts a price on Olympic medals, in this case \$100,000, with his new country (“employer”) weighing the cost of “purchasing” Olympic success, especially considering the cost of developing a home-grown Olympic medal (viz. estimated by UK Sport to be in excess of 10 million GBP per medal in 2012).

Another example involved Kenyan officials' initially consenting to runner Stephen Cherono's switch to Qatar because Qatar pledged to finance construction of a stadium in Cherono's hometown of Eldoret. However Kenyan officials subsequently expressed concern about a so-called "brawn drain" when other athletes left as well after being lured by incentives from Middle East countries seeking to improve their athletic profile (Wharton, 2004). A British newspaper referred to Malachi Davis, an American-born runner whose British citizenship application was streamlined so he could compete in the 2004 Olympics, as "the California carpetbagger" (Wilson, 2004). Athletes and coaches who have lost their positions on their native Olympic teams to foreign athletes, such as the 2004 Greek baseball team made up almost exclusively of North Americans, have also expressed concern about labor migration in this sector.

The favoring of foreign labor in the Olympics parallels trends in other sectors of industry, such as in medicine, academics and technology (Straubhaar, 2000). On one hand, countries can import talent to achieve a competitive advantage. On the other hand, domestic development becomes affected with less of an incentive to train homegrown talent. For instance, this has led to a debate about migration policy for Table Tennis Canada in response to Canada and many other country's fast-tracking Chinese table tennis players for citizenship to compete for a new country in Olympic and major international competition (Shimo, 2008). After initially engaging in the importation of Chinese table tennis talent at the expense of homegrown talent, Canada's governing body for table tennis favored eligibility restrictions in order to foster domestic sport

development. The International Table Tennis Federation intervened in 2008 and ruled that adults over the age of 21 could not change citizenship and compete for a new country in certain international competitions (Shimo, 2008). Unlike the other global market professions cited by the GCIM in 2005 (information technology specialists, senior academics, health professionals and teachers), who can have longer careers and more opportunities for productivity and job security, Olympic athletes have a relatively small window of opportunity with the chance for Olympic success occurring only once every four years.

In terms of IOC policy, athletes can represent a country of which they are a citizen, and citizenship is ultimately determined by the countries themselves (no matter how much the IOC disapproves of a country's naturalization policies). Note that in other industries no citizenship requirement exists in order to be productive for a new country. In other words, the inventors studied by Oettl and Agrawal (2008) did not necessarily have to be citizens of the new countries in which they registered patents. However, increasingly, citizenship processes are streamlined for athletes from whom a country can benefit from their skills (Thibault, 2009). Along with visa programs favoring other types of highly skilled workers, a selection bias exists toward attracting particularly highly skilled foreign labor (Kanbur & Rapoport, 2005). In the 1991 Olympic Charter, the IOC introduced a bye-law to the Nationality of Competitors rule that if athletes have dual citizenship, they may choose which country they wish to represent. For example, cyclist Bradley Wiggins, who has won a total of six medals representing Great Britain in 2000, 2004 and 2008, has *three* passports. He was born in

Belgium where his *Australian* father, Gary, was based as a professional cyclist, and he grew up in *Great Britain* (NBC Sports, 2004, “Cycling”, Vol. 5, p. 214). The 1991 bye-law presents dual citizenship regulations approximately 70 years after the IOC first required Olympians to be citizens of the country they represent. Prior to 1920 no citizenship requirement existed in the Olympic Charter. Before this time it is difficult to give the exact number of medals awarded to some countries due to the fact that teams were sometimes composed of athletes from different countries. Today if athletes represent one country and then would like to represent a different country either because they have dual citizenship or change their citizenship, the Olympic Charter requires at least three years to have passed since they last represented their former country in an Olympic Games or world or regional championships sanctioned by an international federation of sport. The three-year waiting period may be reduced or cancelled by an agreement of the national Olympic committees and international sport federations involved (IOC, Olympic Charter, Chapter 5, Bye-law to Rule 42, 2007). The nine-volume research manual NBC Sports compiled as the official United States broadcaster of the 2004 Summer Olympics addresses this process by explaining that first the national Olympic committees from which the athlete in question emigrates and immigrates must agree. Then both National Olympic Committees (NOCs) approach the relevant international federation and the IOC Executive Board, “which almost always agree to waive the waiting period” (NBC Sports, 2004, “Citizenship Rules in the Olympics”, Vol. 1, p. 82). Just like labor migration in general, the IOC as an international non-governmental organization (NGO) would

need to cooperate with international sport governing bodies, national governments, national NGOs in the form of national Olympic committees and national sport governing bodies in the co-governance model advocated by Groeneveld (2009). Each governmental and non-governmental entity has a different stake, making effective uniform migration policy difficult. Taylor (2005, p. 580) argues that immigration policies often represent “an exercise in futility.”

To illustrate the contradictory nature of IOC policy, on one hand, the Olympic Charter states, “The Olympic Games are competitions between athletes in individual or team events and not between countries” (IOC, Olympic Charter, Chapter 1, Rule 6, 2007). On the other hand, the Olympic Charter mandates, “Any competitor in the Olympic Games must be a national of the country of the NOC [National Olympic Committee] which is entering such competitor” (IOC, Olympic Charter, Chapter 5, Rule 42, 2007). The official Olympic Report does not include countries’ medal totals, only competition results. The IOC’s official website (www.olympic.org) does include country medal standings for each Olympic Games but with a written disclaimer that the IOC does not recognize medal ranking per country as an order of merit. Nevertheless medal standings are featured prominently in the media and are often used as a benchmark by countries for evaluating their investment in elite sport funding (Hilvoorde et al., 2010).

Chalip (1995, p. 4) notes that rational policymaking becomes more difficult when dealing with “sacrosanct doctrines,” such as the Olympics. Milton-Smith (2002) contends that the Olympic Charter must be made relevant to the 21st century. The tensions between the IOC and NOCs in the Olympics seem

endemic to labor migration policy in general, as international and national interests often conflict (Asis & Piper, 2008; Donaghey & Teague, 2006; Taylor, 2005). Current labor migration policy within the Olympics pits IOC doctrine and rhetoric that “confronts” NOC and national government policies on recruiting talent. Labor migration in the Olympics has revealed a tension that exists between what the IOC defines as a “citizen” of a country and government policies on citizenship. Groeneveld (2009) argues for “co-governance” between NGOs (cf. the IOC and NOCs) and governments. However the question of the autonomy of the IOC in relation to individual governments (and indeed the larger consequences of the autonomy of sport from government control) has limited opportunities for co-governance. This can also be seen within other conflicts between sport and government, such as antitrust exemptions for professional baseball in the United States and college football’s Bowl Championship Series. Hence, as Chalip (1995) notes, sport policy tends to be reactive rather than proactive.

The fact that birthplaces and migration data on Olympic athletes are not readily available hints at the challenges of tracking a phenomenon that has become an important issue for the Olympics in the 21st century. Asis and Piper (2008) note that limitations in the availability of data often confront labor migration researchers; yet, it is a vital tool for formulating sound labor migration policy and for evaluating the ramifications of migration policy and advocacy issues (which begs the question as to why a powerful NGO, such as the IOC, does not maintain the above records).

Chapter III: Research Questions

Based on the preceding review of the literature, the current research investigates migration by a highly skilled labor force (elite athletes), which has been argued to be afforded the greatest degree of worldwide mobility as a function of their very unique talents (GCIM, 2005). Similar to Oetl and Agrawal (2008), archival data are employed to trace the capital mobility of a particular skill across borders. Given the availability of individual performance records kept in the sports entertainment industry and how they can be used to develop and test economic models and theories because of well-defined measures of productivity and comparison (Kahn, 2000; Munasinghe et al., 2001; Moskowitz & Wertheim, 2011; Torgler, 2009), this business context presents a unique research opportunity to take a more global perspective on the interactions between origin and destination countries, as called for by Asis and Piper (2008). Like Johnson and Ali (2004) and Moosa and Smith (2004), a non-sporting, economic variable's effect on productivity is analyzed within the Olympic context.

Research Question 1a: Which regions of the world have experienced the greatest inflow of foreign-born Olympic medal winners since 2000?

Research Question 1b: Which countries have experienced the greatest inflow of foreign-born Olympic medal winners since 2000?

Research Question 2a: Which regions of the world have experienced the greatest outflow of foreign-born Olympic medal winners since 2000?

Research Question 2b: Which countries have experienced the greatest outflow of foreign-born Olympic medal winners since 2000?

After establishing patterns of migration first, the study also assesses productivity changes and competitive advantages associated with foreign-born labor in a highly competitive, multi-billion dollar global enterprise, given the efforts by many countries to attract such talent to reap the ancillary benefits of their productivity (Rathke & Woitek, 2008; Johnson & Ali, 2004).

Research Question 3a: In light of the world's international migrant population of 2.9 percent (GCIM, 2005), what is the total size of the immigrant medal-winning athlete labor force in the Summer Olympics in 2000?

Research Question 3b: In light of the world's international migrant population of 2.9 percent (GCIM, 2005), what is the total size of the immigrant medal-winning athlete labor force in the Summer Olympics in 2004?

Research Question 3c: In light of the world's international migrant population of 2.9 percent (GCIM, 2005), what is the total size of the immigrant medal-winning athlete labor force in the Summer Olympics in 2008?

Research Question 4a: What are the global productivity effects (Olympic medals) of highly skilled foreign-born labor (non-native Olympic athletes) in the Summer Olympics in 2000?

Research Question 4b: What are the global productivity effects (Olympic medals) of highly skilled foreign-born labor (non-native Olympic athletes) in the Summer Olympics in 2004?

Research Question 4c: What are the global productivity effects (Olympic medals) of highly skilled foreign-born labor (non-native Olympic athletes) in the Summer Olympics in 2008?

Research Question 5a: After controlling for other variables that have been shown to be related to medal productivity for countries in the Olympics (e.g. GDP per capita, population), what role does labor migration play in 2000?

Research Question 5b: After controlling for other variables that have been shown to be related to medal productivity for countries in the Olympics (e.g. GDP per capita, population), what role does labor migration play in 2004?

Research Question 5c: After controlling for other variables that have been shown to be related to medal productivity for countries in the Olympics (e.g. GDP per capita, population), what role does labor migration play in 2008?

Research Question 6a: When comparing an individual country's performance between successive Olympic Games in 2000 and 2004, does a change in the number of non-native medal winners have a statistically significant impact on its overall medal totals?

Research Question 6b: When comparing an individual country's performance between successive Olympic Games in 2004 and 2008, does a change in the number of non-native medal winners have a statistically significant impact on its overall medal totals?

Answers to these questions will add to the academic literature on highly skilled labor migration phenomena and on medal productivity. The current study also has important applied implications, as this is the first work to quantify labor migration effects that are relevant to the world's largest sport-business organization (IOC), thereby addressing policy-related concerns raised by its president. Likewise, Groeneveld (2009, p. 423) calls for more research related to sport governance, believing that the relationship between sport federations and government has been "almost entirely ignored." As such, the study examines the issues of citizenship, immigration and assimilation that are relevant to arguably the most influential global sport federation, its constituencies (NOCs), other international and national sport federations, and national governmental policies for individual countries around the world.

Chapter IV: Method

Similar to other labor migration research, the current study used archival data to track the movement of highly skilled labor and subsequent productivity effects (cf. Cymrot & Dunlevy, 1987; Cymrot, Dunlevy & Even, 2001; Johnson & Ali, 2004; Moosa & Smith, 2004; Oettl & Agrawal, 2008). Few studies have attempted to quantify the effects of labor migration in sports on a global level, with the majority being descriptive in nature, offering theories about motivations for sport labor migration rather than modeling the phenomenon. The research focused on athletes who have migrated from their country of birth and captured a medal at the 2000, 2004 and 2008 Summer Olympics for a different country. While literature on labor migration in other sectors has attempted to model labor migration effects, Asis and Piper (2008) argue that few, if any studies, have taken a global perspective. (Olympic) athletes are among the few groups of workers who can seek employment on a global market level (GCIM, 2005) and the sports industry offers relatively readily available data to track individual worker productivity (Kahn, 2000).

Data Source

In order to assess the global productivity effects of a highly skilled migrating labor force in the 21st century, the sample chosen was from the Summer Games in 2000, 2004 and 2008. The Summer Olympics has included more than 10,000 participants from at least 200 countries or territories at each Games in the 21st century. They are larger in scope and more global than the

Winter Olympics, which included approximately 2,500 competitors from 80 countries or territories in the 2002, 2006 and 2010 Games. Approximately 1,800 athletes from 80 countries won medals (as individuals or as part of teams) at each of the past three Summer Games. However no single database provides readily available information that accounts for any migration that has occurred by these competitors. A new database was constructed because the IOC does not keep track of athlete's birthplaces. Given the need to examine each athlete individually and the desire to assess immigrant athlete productivity, this research focused on which medal winners were born in countries different from the one for which they competed.

Sample Construction

The current study used athletes' country of birth and country for which they medal to measure migration effects in the Olympics. In order to construct a dataset of immigrant medal-winning Olympians, each country's medal-winning athletes were examined individually. In 2000, 1,785 athletes from 80 countries won medals (either as individuals or as part of a team). In 2004, 1,840 athletes from 76 countries medaled. In 2008, there were 1,874 medalists from 87 countries. Medals won by athletes born in the country they represent were classified as native medals. Medals won by athletes born in a different country than the one for whom they compete were coded as non-native medals. Similar to Oettl and Agrawal (2008) and in order to answer the research questions about countries and regions with the greatest inflows and outflows of labor, countries

with a net gain of Olympic medal winners were labeled as “importers,” and countries with a net loss of medal winners were labeled as “exporters.”

In response to requests for records to be used in the current study,¹ the IOC replied that it does not keep track of athletes’ birthplaces in its official records. Instead the IOC noted that each NOC is responsible for keeping track of its athletes’ birthplaces. Consequently, without contacting each individual NOC, no single “official” source exists listing the birthplace of *all* Olympic athletes, and there is no comprehensive way of tracking the athletes that win individual or team medals for a country different from the one in which they were born. Instead this study utilized what Johnson and Ali (2004) characterize as “secondary sources” as opposed to official sources of the IOC. Data limitations have often been cited as challenges to ascertaining global productivity effects in labor migration studies (Asis & Piper, 2008). Constructing a dataset of non-native medal winners required searching individually through the 5,499 medalists at the 2000, 2004 and 2008 Games. The independent Olympic database website www.sports-reference.com/olympics included a list of all medalists with links to biographical information where most of the athletes’ birthplaces for this study were obtained. If no birthplace was listed, the medal tables on websites of the individual organizing committees (www.athens2004.com and www.beijing2008.cn) sometimes provided biographical information for medal winners that included birthplaces as provided by NOCs. When the above sources were incomplete, individual NOC websites were consulted, along with media reports about specific

¹ Personal E-Mails to IOC Information Centre. 29 October 2008 & 18 August 2010.

athletes. However NOCs do not make information about athlete origin readily available to be analyzed. A small number of athletes' birthplaces could not be obtained.² These medals were treated as "native" medals, following Oettl and Agrawal's (2008) conservative approach of only accounting for immigrant productivity that could be verified. Although this introduces the risk of type I errors (meaning some immigrant medals may have been missed), the sample serves as a conservative estimate of productivity of foreign-born medal winners. Nevertheless the percentage of these medals was small and is not expected to bias the results.

Oettl and Agrawal (2008) determined patent citations attributed to immigrant inventors using the dataset compiled by the United States Patent and Trademark Office. They pointed out the possibility of making endogenous interpretations that labor mobility directly accounts for productivity effects. This is because available data could not account for dates or motivations of migration. In addition to the absence of a single database with the necessary information to track migration of Olympic athletes, other than a handful of media reports, no dataset offers information on when an athlete's move occurred from country of birth to country represented in the Olympics. Unlike the economic studies of intra-league migration in baseball where leagues can offer a wealth of uniform data to examine, similar databases that would allow one to measure the reason and timing for moves do not exist in this sports industry context due to the international nature of the Olympics. The reason, timing and nature of an

² Out of the 927 total medals in 2000, 30 could not be classified as "immigrant" or "native." Out of 929 total medals in 2004, 11 could not be classified as "immigrant" or "native." Out of 958 total medals in 2008, 19 could not be classified as "immigrant" or "native."

athlete's move affect the big picture of modeling labor migration and of quantifying migration patterns. With voluntary migration being a selective process (Kanbur & Rapoport, 2005), there are a variety of motivations that draw migrant Olympians away from their country of birth to another country, whether the attraction is financial or personal or related directly to a country's athletic recruiting or indirectly to a country's attractiveness for immigrants in general. The destination country features an appeal that the country of origin did not possess. Given that the athlete's new country could attract such raw talent, they ultimately benefited, while the original country did or could not. Consequently, it could be argued that any measurement other than birthplace will introduce some degree of academic subjectivity. When athletes develop their talent can also be a subjective rationale. In addition, the IOC does not distinguish among motivations for migration in the Olympic Charter and treats all immigrants and dual nationals the same, regardless of motivation. These results are interpreted as a conservative starting point for estimating the highly skilled global migration of athletes.

Unit of Analysis

After examining each medal winner from the 2000, 2004 and 2008 Summer Olympics, the total number of non-native medalists represented the size of the migrating labor force, and the total number of medals they won accounted for their productivity (Agergaard 2008; Poli, 2006). Immigrant medal-winning athletes were also counted by continent and country to illustrate the effects and patterns of labor mobility. Oettl and Agrawal (2008) labeled countries with a net gain of inventors as "importers" and countries with a net loss of inventors as

“exporters.” The same typology was utilized herein to characterize the national productivity gains and losses in the number of medals won by migrant athletes over the above time period. Both inventors and athletes are among the minority of truly global labor forces cited the GCIM (2005). Both are highly skilled. However no citizenship requirement exists for immigrant inventors to be productive in their new country, as is the case in the Olympics. Olympic athletes also have relatively shorter careers given the physical demands of competing in elite sports.

The economic studies that predicted Olympic medal totals considered variables such as population and GDP (Johnson & Ali, 2004). These economic and demographic variables were also controlled for in this study. In hierarchical regression analyses, a first model for each year followed Johnson and Ali’s (2004) model for ascertaining demographic and economic variables that are related to medal productivity. Economic statistics were obtained from the World Bank, except in the case of Chinese Taipei, which is not recognized by the World Bank. No GDP per capita figures could be found for North Korea. Political systems were ascertained according to the classification by the United States Central Intelligence Agency. Whether a country was a neighbor of the Olympic host country was determined if it was in the same United Nations Statistics Division geographical sub-region. While Johnson and Ali (2004) accounted for a countries’ climate, they were motivated to do so by the Winter Olympics (where naturally colder regions might have a competitive advantage) but not by the Summer Olympics. They included climate in their Summer Olympic analyses for

consistency but considered the variable not worthy of incorporating into conclusions about the Summer Games. Then in the second level of the regression analyses, classifying whether a country is an “importer” allowed for assessment of labor migration’s contribution to countries’ medal totals in regression analyses after controlling for other variables that have been shown to be related to medal productivity (Oettl & Agrawal, 2008; Johnson & Ali, 2004).

Chapter V: Results

After examining all medalists from the 2000, 2004 and 2008 Summer Olympics individually to determine which of them medaled for a country different from the one in which they were born, migration patterns are first presented by continent and country. Next the global level of highly skilled labor migration in this context and its productivity effects are ascertained and compared to baseline, general migration levels. Then labor migration's effect on overall medal totals in the Summer Olympics are analyzed in light of other economic and demographic variables that have been shown to predict medal totals. Finally changes in total medals for a country in successive Games are compared to changes in migration levels.

Migration Patterns By Continent

Looking first at migration patterns, Tables 1, 2 and 3 show the movement of immigrant medal-winning athletes by continent at each Olympic Games since 2000 and help answer Research Questions 1 and 2 about how countries/regions have experienced inflows and outflows of Olympic medal-winning athletes. Countries are classified by continent according to the United Nations Statistics Division. Regions vary considerably in both their inflow and outflow of immigrant medal winners. European countries account as a destination for most of the athletes born in a different country, and many medal-winning athletes migrated inter-continentally within Europe. (Migration between countries within the same continent is shown in bold in Tables 1, 2 and 3.) The continent that

hosted each of the Olympic Games analyzed in this study (Oceania in 2000, Europe in 2004, and Asia in 2008) featured more immigrant medal winners the year it hosted than in the other two years.

Table 1. The Inter-National Migration of Medal-Winning Athletes by Continent, 2000

2000		DESTINATION CONTINENT						
ORIGIN CONTINENT		Afr.	Asia	Eur.	N.A.	Ocn.	S.A./C.A.	TOTAL
	Africa	1	0	4	1	3	0	9
	Asia	0	4	15	0	2	0	21
	Europe	0	4	40	10	5	1	60
	N. America	0	0	4	0	0	0	4
	Oceania	0	0	0	0	4	0	4
	S. + C. Amer. & Caribb.	0	0	0	0	1	1	2
	TOTAL	1	8	63	11	15	2	100

Table 2. The Inter-National Migration of Medal-Winning Athletes by Continent, 2004

2004		DESTINATION CONTINENT						
ORIGIN CONTINENT		Afr.	Asia	Eur.	N.A.	Ocn.	S.A./C.A.	TOTAL
	Africa	0	0	7	0	2	0	9
	Asia	0	7	24	0	1	0	32
	Europe	0	5	47	5	3	2	62
	N. America	0	0	0	1	1	1	3
	Oceania	0	0	2	0	1	0	3
	S. + C. Amer. & Caribb.	0	0	2	5	0	0	7
	TOTAL	0	12	82	11	8	3	116

Table 3. The Inter-National Migration of Medal-Winning Athletes by Continent, 2008

2008		DESTINATION CONTINENT						
ORIGIN CONTINENT		Afr.	Asia	Eur.	N.A.	Ocn.	S.A./C.A.	TOTAL
	Africa	0	2	6	0	4	0	12
	Asia	1	7	11	0	0	0	19
	Europe	1	7	30	7	3	0	48
	N. America	0	0	5	1	0	0	6
	Oceania	0	0	0	0	1	0	1
	S. + C. Amer. & Caribb.	0	1	2	3	0	0	6
	TOTAL	2	17	54	11	8	0	92

Migration Patterns By Country

There has been an increase in the number of countries featuring productivity by foreign-born labor in the Olympics since 2000. In 2000, 29 out of the 80 countries that medaled (36 percent) included medals by non-native athletes. In 2004, 30 out of the 74 medal-winning countries (41 percent) included at least one non-native medalist. In 2008, 33 out of the 87 countries that medaled (38 percent) featured foreign-born productivity.

Table 4 shows how individual countries experienced gains (“importers”) and losses (“exporters”) of immigrant medal winners to answer Research Questions 1 and 2 about inflows and outflows at the nation level. In 2000, 29 countries had “imported” medal winners, and 41 had “exported.” Of those, 19 experienced a net gain (with Australia the highest at +15), and 35 showed a net loss (with Albania, Germany and Ukraine the lowest at -4). In 2004, 30 countries had “imported” medal winners, and 45 had “exported.” Of those, 22 showed a net gain (with Russia the highest at +12), and 33 had suffered a net loss (with Georgia the lowest at -6). In 2008, 33 countries had “imported” medal winners, and 40 had “exported.” Of those, 23 exhibited a net gain (with Australia the highest at +6), and 27 showed a net loss (with Uzbekistan the lowest at -5).

Table 4: Athletes as Commodities: “Import” and “Export” of Medal Winners

2000							
<u>Medal Gains</u>	<u>Gains</u>	<u>Losses</u>	<u>Net</u>	<u>Medal Losses</u>	<u>Gains</u>	<u>Losses</u>	<u>Net</u>
Australia	15	0	+15	Germany	4	8	-4
Greece	8	0	+8	Ukraine	4	8	-4
Russia	19	12	+7	Albania	0	4	-4
Canada	5	1	+4	Uzbekistan	1	4	-3
Spain	4	0	+4	Romania	0	3	-3
Belarus	4	0	+4	China	0	3	-3
United States	6	3	+3	Georgia	0	3	-3

France	5	2	+3	New Zealand	0	3	-3
				TOTAL	100	100	0
56 out of 200 countries (28%) imported and/or exported medal winners.							
29 countries imported medal winners. 41 countries exported medal winners.							
2004							
<u>Medal Gains</u>	<u>Gains</u>	<u>Losses</u>	<u>Net</u>	<u>Medal Losses</u>	<u>Gains</u>	<u>Losses</u>	<u>Net</u>
Russia	28	16	+12	Georgia	0	6	-6
United States	9	2	+7	Armenia	0	5	-5
Italy	7	0	+7	South Africa	0	4	-4
Australia	8	2	+6	China	0	4	-4
Greece	6	0	+6	TOTAL	116	116	0
58 out of 201 countries (29%) imported and/or exported medal winners.							
30 countries imported medal winners. 45 countries exported medal winners.							
2008							
<u>Medal Gains</u>	<u>Gains</u>	<u>Losses</u>	<u>Net</u>	<u>Medal Losses</u>	<u>Gains</u>	<u>Losses</u>	<u>Net</u>
Australia	7	1	+6	Uzbekistan	1	6	-5
Great Britain	8	4	+4	China	0	4	-4
Azerbaijan	4	0	+4	South Africa	0	4	-4
United States	9	6	+3	Russia	12	14	-2
Singapore	3	0	+3	Armenia	1	3	-2
Turkey	3	0	+3	TOTAL	92	92	0
54 out of 204 countries (26%) imported and/or exported medal winners.							
33 countries imported medal winners. 40 countries exported medal winners.							

To highlight some notable examples, Australia has been an importer at the last three Summer Olympics (+15 in 2000 and +6 in both 2004 and 2008). The United States has been an importer as well (+3 in 2000, +7 in 2004 and +3 in 2008). South Africa has shown a net loss at the last three Summer Olympics (-1 in 2000 and -4 in both 2004 and 2008). Greece featured six immigrant medal winners at the 2004 Games the country hosted but had no immigrant medal winners in 2008. Russia went from a net gain in 2004 to a net loss in 2008 (+12 to -2). Great Britain and Azerbaijan went from net losses in 2004 to net gains in 2008 (-1 to +4).

In terms of productivity of individual countries,³ in 2000, countries with the most immigrant medals were Russia (17), host Australia (14) and Greece (8). Out of the countries that won at least 5 total medals, Greece had the highest percentage of immigrant medals (8 immigrant out of 13 total medals [62%]), followed by Ukraine (4 immigrant out of 10 total medals [40%]). In 2004, countries with the most immigrant medals were Russia (18), Germany (9) and the United States (9). Out of the countries that won at least 5 total medals, Uzbekistan and Croatia had the highest percentage of immigrant medals (both with 3 immigrant out of 5 total medals [60%]), followed by host Greece (6 immigrant out of 16 total medals [38%]). In 2008, countries with the most immigrant medals were the United States (14), Australia (9) and Russia (8). Out of the countries that won at least 5 total medals, Azerbaijan had the highest percentage of immigrant medals (4 immigrant out of 7 total medals [57%]), followed by Turkey (4 immigrant out of 8 total medals [50%]).

Global Productivity Effects

In order to answer Research Question 3 about the global level of migration of Olympic medal winners, Table 5 shows the size of the foreign-born Olympic medal-winning labor force along with the percentage of total medal winners for which they accounted. In 2000, 100 athletes won individual medals or were on a medal-winning team for a country different from the one in which they were born. There were 115 such athletes in 2004 and 92 in 2008. Foreign-born athletes have won medals in more than 75 percent of the Olympic sports (at least 26 different ones) at each Summer Olympics since 2000. The most frequent sports that

³ Full immigrant medal winner standings by country can be provided by contacting the author.

featured non-native medalists are individual sports that offer several events, and consequently opportunities, to medal, such as athletics, swimming and weightlifting. These sports are also relatively accessible worldwide with low equipment, facilities or climate requirements.

When comparing the percentage of immigrant medal winners with the general world's migrant population of 2.9 percent (GCIM, 2005), results of binomial tests for 2000, 2004 and 2008 (shown in Table 5) indicate that the percentage of medal winners who are immigrants is statistically significantly higher than the percentage of the world's international migrant population: 1) 2000 ($z=6.73, p<.001$); 2) 2004 ($z=8.63, p<.001$); and 3) 2008 ($z=5.12, p<.001$).

Table 5. Immigrant Medal-Winning Athlete Labor Force in the Olympics

Year	Total Medal-Winning Athletes	Immigrant Medal-Winning Athletes	Percent
2000	1785	100	5.6% ^a
2004	1840	116	6.3% ^a
2008	1874	92	4.9% ^a

NOTE: ^a denotes proportions that are statistically significantly ($p<.001$) different from the world's international migrant population of 2.9 percent (GCIM, 2005)

Table 6. The Productivity Effects of Immigrant Olympic Medal Winners

Year	Total Medals	Immigrant Medals	Percent
2000	927	98	10.6% ^a
2004	929	103	11.1% ^a
2008	958	91	9.5% ^a

NOTE: ^a denotes proportions that are statistically significantly ($p<.001$) different from the frequency of patent citations attributed to immigrant inventors of 1.2 percent (Oettl & Agrawal, 2008)

To answer Research Question 4 about the global productivity effects (Olympic medals) of highly skilled foreign-born labor (non-native Olympic athletes) in the 21st century, Table 6 indicates for each of the past three Summer Games, approximately 100 medals (one out of every 10) were won either by

athletes competing for a country different from the one in which they were born or by teams that included athletes born in a different country. Note that in some cases single athletes won multiple medals while in other cases multiple athletes competed on the same team to win a single medal. Table 6 also shows the proportion of total medals that were products of labor migration (approximately 10 percent for each Summer Games since 2000).

Rather than comparing this proportion to 0 and assuming no foreign-born productivity to the contrary, the one other study that measured skilled labor productivity – the 1.2 percent of patent citations attributed to immigrant inventors (Oettl & Agrawal, 2008) – is called upon as a measure of comparison. Results of binomial tests for 2000, 2004 and 2008 (shown in Table 2) indicate that the percentage of medals won by non-native Olympic athletes is statistically significantly higher: 1) 2000 ($z=26.06, p<.001$); 2) 2004 ($z=27.53, p<.001$); and 3) 2008 ($z=23.44, p<.001$). One could actually assume that the rate of foreign-born productivity could be as high as 8.0 percent and still find that the proportion of non-native medals is statistically significantly higher ($p<.05$) for each of the past three Summer Olympics.

Labor Migration's Impact on Total Medals

Having made initial efforts to describe the global nature of migration of medal-winning athletes and their overall productivity, a preliminary model is now offered for ascertaining labor migration's impact on medal totals to help address Research Question 5 about labor migration's relationship to total medals won in light of other variables that have been shown to be related to medal productivity.

Table 7 shows hierarchical linear regressions of medal-winning countries for 2000 (N=78), 2004 (N=72), and 2008 (N=85). In the first model, the “traditional” predictors of total medals are also related to total medals won by countries in 2000, 2004 and 2008. In particular, the often-cited variables of population and GDP per capita are statistically significantly related to productivity for countries that medaled.

The second level of the linear regressions for medal totals for 2000, 2004 and 2008 incorporates a labor migration variable classifying whether a medal-winning nation was an “importer” for that particular year (Oetl & Agrawal, 2008). Medal-winning countries also involved in labor migration show statistically significant beta values positively related to total number of medals (Table 7). Medal-winning nations that featured productivity from a foreign-born labor force won 12.02 more medals in 2000, 14.71 more medals in 2004, and 12.61 more medals in 2008 than countries whose medals were won exclusively by native-born athletes: 1) 2000 ($b=12.02$, $t(78)=3.22$, $p=.002$); 2) 2004 ($b=14.71$, $t(72)=3.43$, $p=.001$); 3) 2008 ($b=12.61$, $t(85)=3.51$, $p=.001$). The beta-value of the labor migration variable is nearly identical to the population variable as one of the highest explanatory variables in the model (Table 7). Adding the labor migration variable also adds statistically significant R^2 explanatory power to the model (Table 7). The total R^2 is .38 for the 2000 medal analysis model, .34 for 2004 and .46 for 2008.

When including the variable that accounts for labor migration, GDP is no longer a statistically significant explanatory variable. However a separate logistic

regression shows that the odds of a medal-winning country's also being an "importer" are slightly increased at a statistically significant level by increased GDP per capita. Logistic regressions for 2000, 2004 and 2008 used the dichotomous labor migration variable as the dependent variable and the economic and demographic variables for predicting medals as independent variables. GDP per capita was the only statistically significant predictor: 2000 ($b=.06$, $Wald=6.08$, $p=.01$); 2004 ($b=.04$, $Wald=5.87$, $p=.02$); 2008 ($b=.04$, $Wald=8.70$, $p=.003$). This suggests a possible mediating effect whereby GDP per capita relates to labor migration, and labor migration relates to medals won.

Table 7. Productivity Effects of Medal-Winning Countries by Year

Variable	2000 (N=78)		2004 (N=72)		2008 (N=85)	
	Model 1 β	Model 2 β	Model 1 β	Model 2 β	Model 1 β	Model 2 β
Population (Millions)	.33***	.33***	.37**	.39**	.29*	.29*
GDP per capita (thousands)	.28**	.18	.31**	.20	.29**	.17
Republic/Democracy	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Monarchy	-.13	-.11	(no cases)	(no cases)	-.06	-.09
Single-Party	.12	.12	.04	.00	.11	.07
Military	(no cases)	(no cases)	(no cases)	(no cases)	-.02	-.01
Other Political System	-.04	-.05	-.07	-.06	-.02	-.03
Host Nation	.27**	.23*	.01	-.04	.27	.31*
Neighbor Nation	-.04	-.01	-.02	-.12	.07	.05
Labor Migration		.32**		.38***		.32***
Total R ²	.29	.38	.22	.34	.37	.46
Change in R ²		.09**		.12***		.09***

* $p<.05$; ** $p<.01$; *** $p<.001$

NOTE:

Model 1: replication of other studies predicting medal totals (Johnson & Ali, 2004; Rathke & Woitek, 2008)

Model 2: Add "Labor Migration" variable classifying whether a medal-winning nation is an "Importer" (Oetl & Agrawal, 2008)

Change in Total Medals Related to Change in Migration Levels:

To answer Research Question 6 about an individual country's performance between successive Olympic Games, the change in the number of non-native medal winners is examined in light of change in overall medal totals from one Olympic Games to the next using a fixed-effects model. To examine this visually, a histogram plots the change in the number of immigrant medal-winning athletes the country featured from one Olympics to the next (X) onto its numerical change in total medals (Y). No relationship appears to exist when comparing 2000 to 2004, $b=.36$, $R^2=.04$. Thus medal totals change without respect to the migrating Olympic labor force from 2000 to 2004. However for the $N=42$ countries that featured non-native medal-winning athletes in either the 2004 or 2008 Summer Olympics, change in the non-native medal-winning labor forces impacted change in total medals.

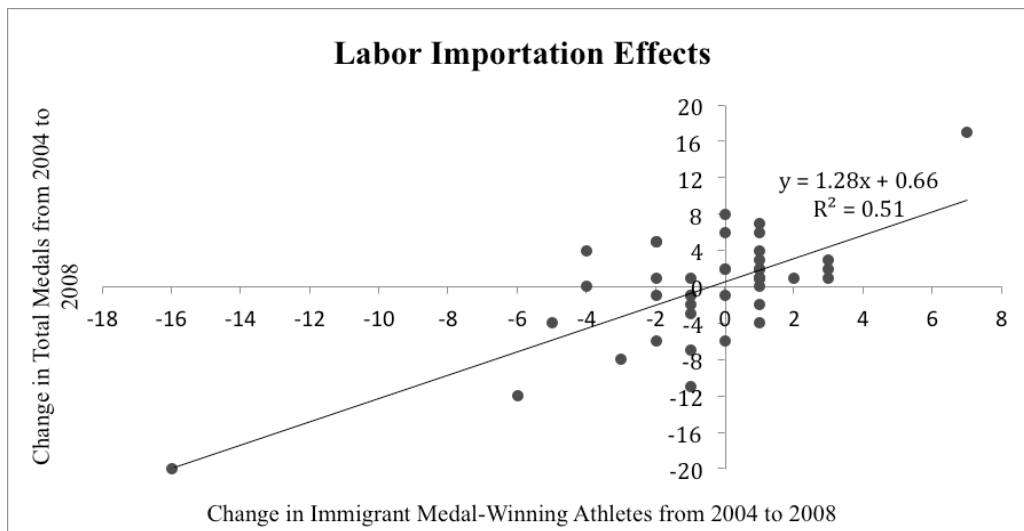


Figure 1.

The slope in Figure 1 ($b=1.28$) indicates a positive relationship between a change in the number of immigrant medal-winning athletes from 2004 to 2008

and a change in total medals from 2004 to 2008. The immigrant medal-winning athletes having a Proportional Reduction in Error explanatory power of $R^2=.51$ on a country's overall medal total. Thus for the countries involved in Olympic medal labor migration, 51 percent of the variation in a country's change in medal total from 2004 to 2008 can be explained by a linear association with a change in immigrant medal-winning athletes from 2004 to 2008. Note that the non-native medal-winning labor force represented 6.3 percent of the total for 2004 and 4.9 percent of the total for 2008. Note also that the slope is greater than $b=1$, meaning that each non-native medalist is related to an increase of more than one medal of the country's total. In some cases non-native medalists captured more than one medal; in other cases multiple immigrant Olympians were on a team, and their combined efforts yielded a single medal. Yet in the aggregate, each additional non-native medalist (individual or team member) in 2008 was related to more than one medal.

Chapter VI: Implications, Limitations and Future Directions

In order to assess the global productivity effects of highly skilled labor migration, the current study examined the migration patterns and the productivity resulting from migration in the context of immigrant medal winners at the Summer Olympics since 2000. The sports entertainment industry provides a unique venue to respond to calls to study labor migration on a global level because athletes represent a globally ubiquitous and a particularly mobile labor force (GCIM, 2005). The sports industry also presents a unique context in which to develop and investigate economic theories and models given the relative availability of performance statistics, clear metrics and controlled environments (Kahn, 2000; Munasinghe et al., 2001; Torgler, 2009; Moskowitz & Wertheim, 2011). By comparing non-native medalists and medals with native medalists and medals from a global perspective and by regions and countries in a similar manner to how Oettl and Agrawal (2008) compared non-native and native inventors, this research is the first to show labor migration's presence and influence in one of the world's largest sports business venue. The scholarly and applied implications of the current research are discussed below, along with limitations and future directions for research.

Scholarly Implications

Highly Skilled Labor Migration Patterns.

This study answers calls for the investigation of immigration and assimilation as a new and relevant policy sciences research area (deLeon &

Vogenbeck, 2007). Current research on labor migration has sought to demonstrate how people have more opportunities beyond their local borders and can consequently influence productivity (Hewlett, 2002). This study first explains how countries experience gains, losses and exchanges of this form of capital mobility through patterns of migration (Straubhaar, 2000). Like the GCIM (2005) report suggests about the global nature of migration of athletes and entertainers, migration by Olympic athletes appears to be globally ubiquitous. More countries have won medals with foreign-born athletes in each Summer Olympics since 2000. Existing research suggests that countries and continents vary in their inflow and outflow of human capital. Similar to how Oettl and Agrawal (2008) found different levels of gains and losses resulting from knowledge flows of immigrant inventors across borders, in this study some continents (see Tables 1, 2 and 3) and countries (see Table 4) experience a net gain of immigrant medal winners while others experience a net loss. Thus certain countries can be viewed as importers of athletic talent while others can be viewed as exporters. Many of the countries with a predominance of non-native medal winners (e.g. United States, Russia, Australia) also feature large populations of international migrants and policies designed to reap the benefits of highly skilled labor (GCIM, 2005). The United States, Russia, Australia and Germany have been among the top five importers of foreign-born Olympic medal winners since 2000. Oettl and Agrawal (2008) cited the United States, Germany, Japan and Great Britain as the countries most involved in migration of inventors and the patent citations that result from migration. So similar to how Oettl and Agrawal (2008) modeled knowledge

flows, the findings in this study begin to quantify “brawn drains,” “brawn gains” and “brawn exchanges” (Wharton, 2004). Most previous studies on labor migration in the sports entertainment industry have not modeled migration patterns or productivity.

When comparing the frequency of Summer Olympic immigrant medal winners (see Table 5) with the world’s international migrant population of 2.9 percent in 2005 (GCIM, 2005), the binomial test results indicate that non-native medal winners occurred at a statistically significantly higher rate at the 2000, 2004 and 2008 Summer Olympics. The greater frequency of this particular form of highly skilled labor migration seems to be in line with what would be expected from the immigration policies and visa programs in many countries that favor skilled labor migration (Kanbur & Rapoport, 2005; Taylor, 2005). The migrating labor force of athletes in the current study is shown to be higher than the overall percentage of international migrants.

Highly Skilled Labor Migration Productivity.

This study then determines that the productivity related to athletic talent flows across borders at each of the past three Summer Olympics has resulted in approximately 100 medals (one out of every 10) won either by athletes competing for a country different from the one in which they were born or by teams that included athletes born in a different country (see Table 6). These findings begin to elucidate on a global level the notion that Hilvoorde et al. (2010) put forth that Olympic medals won by athletes of foreign origin contribute to the effects of the medal totals of the immigrants’ new countries. Through athlete labor migration,

an Olympic medal awarded to one country can be the result of what Poli (2006) argues is analogous to the byproduct of raw materials of another country. In this way, one country achieves a competitive advantage based on another's resources. However in this case, the country of origin generally receives no consideration (monetary or symbolic) for its native talent. Immigrant Olympians are shown to be highly productive if compared to the 1.2 percent of patent citations attributed to immigrant inventors (Oettl & Agrawal, 2008). Yet more research is needed in order to be able to definitively evaluate productivity effects across different industry sectors.

Hence this study has found preliminary evidence of talent flows and resultant productivity caused by labor mobility in one of the largest and most global sports business venues, the Summer Olympics. Similar to the example of the Nigerian computer engineer working in Sweden, illustrated by Doyle (2005), results suggest that Olympic athletes in the 21st century can be productive for a country different than the one in which they are born. As such, the Olympic athlete labor force can serve as a metaphor and platform to analyze other skilled migrating labor forces, such as academics, technology specialists and doctors, in the same way that sport lends itself to modeling other economic phenomena (Kahn, 2000; Munasinghe et al., 2001; Torgler, 2009).

Migration's Impact on Medal Totals.

After controlling for other variables that have been found to be related to medal productivity for countries in the Olympics, countries that featured non-native medal winners won more medals in 2000, 2004 and 2008 than countries

whose medals were won exclusively by native-born athletes (see Table 7), hence showing labor migration's potential impact on overall productivity. This study first replicated the major findings of existing medal literature, which has also found population and GDP per capita to be statistically significantly related to medal totals (Johnson & Ali, 2004; Rathke & Woitek, 2008). While other medal studies have looked at country's internal characteristics such as population, GDP per capita and government type, results here suggest how the medal literature could be extended to account for the contribution of external human capital in the form of labor migration. Operationalized as it was here, labor migration had an effect comparable to population size. Labor migration also mediated the effect of GDP per capita in each of the past three Olympic Games. Countries with higher GDP levels displayed greater probability of attracting productive foreign talent, in line with how in other business venues richer countries are considered to be more attractive to highly skilled labor (GCIM, 2005).

In trying to understand labor migration's effects on a country's overall Olympic infrastructure, the fixed effects linear regression illustrated in Figure 1 suggests a positive correlation between a change in immigrant medal-winning athletes from 2004 to 2008 and a change in total medals from 2004 to 2008. This may seem intuitive, and it may appear obvious that an imported medal winner will affect a country's medal total. However, the histogram plot results illustrate how the migrating medal-winning labor force that accounts for approximately 10 percent of total medals affects the impact of the other 90 percent of medals. Each additional non-native medal winner also corresponded to more than one total

medal increase. Immigrant medal winners can win multiple medals, or multiple immigrant athletes can combine on the same team to win a single medal. Foreign-born medal winners appear to have given some countries a competitive advantage and to have affected a country's total medal output, similar to how Straubhaar's (2000) New Growth Theory illustrated how the migrating labor force of doctors could give countries a "competitive advantage" in medicine. Spencer (2002) also proffered positive evaluations of labor migration's contribution to the public purse in Great Britain.

Applied Implications

Policy Implications.

This study represents the first-known work to investigate labor migration patterns and productivity in the context of arguably the largest, oldest and most global example of sports business, the Summer Olympics. Assessing labor migration's contribution in the Summer Olympics can begin to inform rational policymaking for the world's largest sports organization, the IOC, whose president has raised concerns about the presence of labor migration in the Olympics. The results suggest that if the IOC is truly interested in understanding and regulating labor migration in the Olympics, the organization should collect data to track the phenomenon and measure its effects. At a minimum, collecting data for each athlete related to birthplace would allow the IOC to trace basic labor migration patterns and totals. However the IOC does not do this, and its policy to deal with labor migration has often proved ineffective. On the contrary the IOC has benefited from labor migration's presence in the Games in terms of the

compelling competition these athletes provide. The difference between the rhetoric and actions of the IOC calls into question the organization's true stance on labor migration. Other professional sports leagues such as NHL hockey and NBA basketball in North America have openly embraced and promoted their foreign-born workforce. However, perhaps because the Olympics are still divided along national lines, the IOC has struggled to balance the multi-national composition of the teams that compete and the fact that the teams and athletes still represent a single national identity in competition.

Labor migration brings out competing interests among labor forces that seek to maximize benefits and capitalize on their talent, international organizations that generally attempt to regulate migration, and national policy that often aims to attract optimal talent (Donaghey & Teague, 2006; Groeneveld, 2009). The IOC as an international non-governmental organization (NGO) clashes against national governments and national NGOs in the form of national Olympic committees with regard to immigration policy and defining citizenship criteria. Athletes try to navigate the regulations to seek the best personal and athletic opportunities. The competing interests are counter to the co-governance model advocated by Groeneveld (2009). In European soccer, European Union policy, such as the 1995 Bosman ruling, allows players to move freely to play in different country's soccer leagues regardless of whether they are citizens of the country in which they desire to play (McCormick, 2004). This is not the case in the Olympics where the IOC has citizenship requirements in place, but countries looking to attract optimal talent can circumvent them with policies that fast track

citizenship for elite athletes (McCormick, 2004). In this way, the Olympics illustrate some of the policy, cultural and social consequences and tensions of migration, which are less explored in migration literature (Asis & Piper, 2008).

Olympic Medal Productivity.

The contribution labor migration has made in the Summer Games since 2000 has the potential to be influential as countries invest millions of dollars in Olympic success. In particular, a few countries that went from being classified as an exporter of immigrant medal winners to an importer had some of their most successful Olympics ever in terms of medal won. For instance, Azerbaijan went from a net loss in 2004 to a net gain in 2008 (-1 to +4; see Table 4) and had its highest medal total ever (7) in 2008. Great Britain also went from -1 in 2004 to +4 in 2008 (see Table 4), and in 2008 Great Britain had one of its most successful Olympics. Its overall medal tally (47) was its most since the 1908 London Games (146).

In the context of labor migration in general, Straubhaar (2000, p. 17) poses an interesting question in relation to a country's health care:

As far as human capital accumulation generates some positive spillover effects for an economy, a strategic decision has to be taken by the policy makers: Should they produce their brain gains by themselves and invest in the accumulation of human capital by publicly subsidised schooling and research activities? Or should an economy "free ride" and "import" human capital that has been produced outside the country (and that has been financed by others!)?

In the specific context of the Summer Olympics, is it possible to "buy" Olympic success in the same way professional teams can purchase the best talent as opposed to developing the talent on their own (like the New York Yankees

signing other teams' best pitchers rather than developing players within their own minor league farm system)? In other words, do immigrant medal winners have a significant effect on the overall success that also includes the 90 percent of native (non-immigrant) medal winners? Could the Summer Olympics become a *de facto* professional sports league (an extension of the professionalization qualities Milton-Smith [2002] argues the Olympics already exhibit) with countries playing the role of teams? There seems to be some momentum in this direction. However it is important to note that for a country to increase its Summer Olympic medal total, it is not sufficient to simply import any athletes from other countries, but rather it must import athletes of a caliber who can actually win a medal. Similarly when Straubhaar (2000) poses his question regarding countries seeking to improve their medical care, it is not sufficient to import any medical student but rather doctors who have the ability to affect a country's medical practices. The importation must result in productivity for the new country to benefit (Spencer, 2002). Obviously many factors go into a country's medal total, but nonetheless a relationship seems to exist in the 21st century between "importing" Olympic success and increasing overall medal totals.

Yet in addition to directly recruiting foreign talent, which are the cases of labor migration most often highlighted by media coverage, nations have been able to take advantage of the various other motivations of migration that draw immigrant Olympians away from their country of birth to another country, such as those related to a country's attractiveness for immigrants in general. Whether the destination countries offers money in exchange for athletic success, better athletic

training, more opportunities to compete, or the chance to create a better life outside of sports, the destination country features an appeal that the country of origin did not possess. Given that the athlete's new country could attract such talent, they ultimately benefited, while the original country did or could not. Many countries have policies in place to attract elite athletes to their country (similar to attracting other highly skilled professions), and nations devote substantial resources to training athletes and pursuing Olympic success. Results here suggest that all motivations of migration should be considered, not just those related to direct recruitment of athletes, when analyzing the productivity effects of labor migration.

However, despite the benefits "brawn gains" have had for some countries' medal productivity in the Olympics, the practice of featuring non-native medal winners could lead to a reliance on foreign talent, as is the case in other business sectors, such as academics, medicine and technology. This may not be conducive to long-term growth of a country's Olympic sports infrastructure, as was the case with Table Tennis Canada when the majority of table tennis players representing Canada in major competitions were born in China (Shimo, 2008). Many major international table tennis competitions became competitions among Chinese table tennis players competing for different countries. In response, Table Tennis Canada chose to self-regulate to foster domestic development of the sport.

Limitations and Future Directions

The current study has attempted to measure the global productivity effects of highly skilled labor migration by examining one of the few truly global labor

forces (athletes) within the context of possibly the most international sports industry venue (the Summer Olympics). However the nature of the data must be considered when attempting to draw firm conclusions about labor migration in this context. In terms of method, given certain data limitations, which is often the case in labor migration studies (Asis & Piper, 2008; Donaghey & Teague, 2006), this research has offered a preliminary and conservative metric (country of birth) to better understand the worldwide effects of labor migration on productivity in the sport industry. In terms of assessing productivity, like Oettl and Agrawal's (2008) measure for the output of migrants in the context of patent citations, one assumes an interconnected relationship between labor migration and subsequent productivity because of the lack of data to account for timing and motivations of migration. That is, these results are interpreted as deriving from a causal relationship whereby labor flows directly account for productivity gains and losses. Oettl and Agrawal (2008) were similarly unable to account for migration timing and motivations. An athlete's new country does play a role in training the athlete to win a medal, although the immigrant athlete still embodies what Poli (2006) analogizes as the raw material of the original country. The reason, timing and nature of an athlete's move affect the big picture of modeling labor migration. Also, in terms of policy, given that the IOC does not track this data for the Olympics and that a dataset had to be collected and constructed, country of birth serves as a base starting point for scholarship in this area. This study needed to utilize "secondary sources" (Johnson & Ali, 2004) as opposed to being able to rely exclusively on official IOC sources, as some other studies that have

examined medal totals were able to (Johnson & Ali, 2004; Shibli et al., 2007).

Yet the initial findings that labor migration has an effect on productivity in this context begin to provide an empirical understanding for what academics (Hilvoorde et al., 2010) and the IOC have put forward as an issue but have yet to quantify to date. Migrating athletes have become an influential labor force in the Summer Olympics, and labor mobility has become a key contributor to countries' productivity. Future studies should seek to develop a dataset that accounts for timing and distinguishes motivations for migration when assessing labor migration's effects on productivity. This would require cooperation among scholars, the IOC, NOCs and athletes across many different countries. Future analyses could extend to other Olympic years to provide historical perspective of highly skilled labor migration productivity effects. Research could also study migration patterns among all Olympics athletes (not just medal winners), although at the moment this will require examining more than 10,000 athletes from each Games individually. Other sports industry venues could be considered as well in order to achieve a broader understanding of labor migration's influence on the sports entertainment industry and one of the most globally ubiquitous cultural and business institutions. Some work has been done in this area in American professional baseball. Yet few sports industry venues are truly global in terms of productivity. Professional leagues generally fit within a national/regional framework (e.g. National Hockey League in North America, La Liga soccer in Spain, Australian Football League rugby) as opposed to global world cup competitions in soccer, rugby and baseball.

In terms of the Olympics, it will be interesting to see whether labor migration patterns and effects continue into 2012 and the future. It will also be interesting to explore whether labor migration has similar strong effects on productivity in other global venues both inside and outside of sport. Contemporary global financial, technological, social and cultural interconnectivity has allowed workers to access and influence opportunities and resources beyond their borders (Doyle, 2005; Kanbur & Rapoport, 2005). More people now live outside their country of birth than at any time in history and can have significant and measurable effects and influence on productivity in their new country.

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