"Quédate con nosotros"? The Impact of Emigration on Wages in Honduras

By Jason Gagnon[1]

Junior Policy Analyst at the OECD Development Centre and PhD candidate at the Paris School of Economics

Paris, France, email: jason.gagnon@oecd.org or jason.gagnon@gmail.com

Abstract

While the econometric literature on the impact of immigration on labour markets is well developed, there is a striking gap with regards to the impact of emigration on sending countries. Departing from the established literature measuring the impact of immigration and building on Borjas (2003) and Mishra (2007), this paper attempts to narrow that gap by investigating whether the large and intense emigration period from 2001 to 2007 to the US increased wages in Honduras, by exploiting the variation of labour supply by skill group in the labour market. Using an instrumental variable approach, the estimates show that a 10% increase in emigration from Honduras increased wages in Honduras by as much as 11%, an increase which is higher than previous findings in other countries. These findings are driven by women and by urban regions.

Keywords: Honduras, Labour Force, Wages, Emigration

JEL Classification: J21, F22, E24

I. Introduction

While the long and standing literature on the impact of immigration on average wages in the receiving country has generally concluded that in most countries the negative impact is small and often statistically insignificant, the literature on the impact of emigration, apart from a few recent studies, has remained largely theoretical (see for instance Berry and Soligo, 1969; Hatton, 2007). This is rather surprising considering that emigration rates are relatively higher than immigration rates when compared to the size of the population they impact, particularly for small poor countries. As an anecdotal example, countries with a high proportion of immigrants[2], such as Canada and Australia, have stocks of immigrants equaling 19% and 20% of their total population while in countries with high proportions of emigrants like Jamaica and Albania, emigrant stocks as a percentage of population are 39% and 27%

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[2] Does not include countries with populations under 1 million as well as countries from the Gulf Cooperation Council (GCC).

(World Bank, 2008); these figures get much larger when we consider the direct population they impact on the labour market: the country's labour force.

Migration is often regarded as a mechanism for equalizing development levels between countries. One of the channels through which this is achieved is through wages. Providing a basis to this research, studies which look into the impact of emigration on labour in the sending country have primarily been micro-oriented, examining the changes which take place within a household when a member leaves to work abroad. At the macroeconomic level, research is much sparser. In one of the few studies, Mishra (2007) investigates whether emigration rates from Mexico to the US impacted wages in Mexico between the 1970s and the 2000s and finds that a 10% increase in emigration of specific education-experience (skill-) groups raised wages of their respective skill-groups in Mexico by an average of 3% to 4%.

This paper subscribes to a similar methodology with data from Honduras but with a shorter, more intense timeframe. It empirically examines the effect of Honduran emigration to the United States on wages in Honduras combining data from Honduran biannual multi-purpose household surveys and annual American Community Surveys (ACS) on migrant stocks of Hondurans in the US for the years 2001, 2004 and 2007, covering a period where emigration from Honduras was high – largely spurred by the devastation left by Hurricane Mitch – and soon followed by political campaigns such as the '*quedate con nosotros*' campaign (translation: '*stay with us*') launched by the Honduran Association of Maquiladoras. Using this methodology, I find that emigration had a strong and positive effect on Honduran wages in the given period; the elasticity is about 1.21, depending on various and reasonable assumptions. This can be interpreted, on the average, as an 11% increase in wages for a specific skill group following a 10% increase in emigration of that same skill-group from Honduras. This elasticity is higher than those derived in comparable studies on the impact of either immigration or emigration.

This paper is a contribution to the literature in many ways. First, there are relatively few studies dealing with emigration from Honduras, despite its recent remarkable increase, and one purpose of this paper is to fill this gap. Specific country-based research on the impact of emigration is important because the impact depends primarily on two factors which may vary by country and by migration corridor: it depends on how the skill-composition of emigrants as a group differs from the skill-composition of the resident population remaining in the home country[3] and on the way the home economy adjusts to changes in the skill mix (Dustmann *et al.*, 2005). Open economies with a diverse export mix will tend to adjust their export mix and revert to their long term labour market equilibrium. The composition of emigrant flows and adjustment mechanisms differ across countries, sometimes in important ways. Given these differences, it would be wrong to infer from other studies the effects of emigration on the Honduran labour market.

Second, the labour market in Honduras is relatively dysfunctional in comparison to previously studied countries. Honduras is a small country, where internal migration is low (UNAT-UNFPA, 2006), brain drain

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[3] For instance, if the distribution of both groups is similar in terms of skill, the effect on the labour market will either result in zero or a minimal change. Conversely, a change in the composition of the supply of skills due to im/emigration could change, at least in the short term, the equilibrium of the labour market.

rates are high, emigration rates have risen relatively quickly in the last 15 years and immigration rates and national labour market integration are relatively low. These facts make Honduras a unique country study with respect to previous studies on Mexico, Moldova and Puerto Rico. A key question is, despite having a dysfunctional labour market with a big reserve army of workers and largely informal activities, can emigration still have an impact on its equilibrium?

Third, there are several methodological improvements over the past contributions. The data used in the analysis provide an opportunity to deal with the potential seasonality in wages by taking the mean wage at two different points in the year rather than only one as in previous studies, an important point in a country like Honduras, where low-skilled labour is highly concentrated on seasonal agriculture (coffee and bananas). The data are also collected in a way that includes irregular Honduran immigrants in the US, whereas other studies turn to estimations based on *assumptions* made on the count of the irregular migrant population. This latter point is important when dealing with Honduras as it experienced a nearly 100% increase in irregular migration to the US from 2000 to 2009, the fastest growth of irregular migration to the US by any country in that time period (Baker *et al.*, 2010). Finally the paper takes an added step in tracing the source of the increase in wages by looking at particular subgroups of the population based on education, gender and geographic locality.

In this paper I find that wages increased on average by 11% following a 10% increase in emigration. This result is much larger than any previous study on this subject and cast doubt on the use of decennial census data over a long period of time and on large countries with dynamic labour markets to measure the impact of emigration. The results lend support to the argument of economic convergence between countries which has implications for the heated and political debate on the loosening of national borders.

The rest of the paper is divided as follows. Section 2 describes the motivation of the paper while sections 3 and 4 provide a literature review and a background for the Honduran context respectively. Section 5 describes the empirical framework. Section 6 describes the data and provides summary statistics and section 7 provides and discusses results. Section 8 concludes the paper.

II. Background and Motivation

II.1 Migration and the Labour Market
The general motivation for investigating the links between emigration and labour markets is tied to the resurgence of international human migration in the last 20 years and the concern that the distributional effects of migration may yield positive but also negative effects for both sending and receiving countries. Migration often represents an attractive way out of poverty as it increases wages as well as health and educational outcomes. As such, demographic pressures, rising employment opportunities and the rise of communication and transport technology should effectively increase the "demand" for migration; the current figure of 3% of the world's population tagged as migrants is bound to increase.

Despite potentially benefitting some groups or individuals more than others, migration contributes positively to the economic convergence of countries. One impact seldom mentioned and by which this mechanism occurs, is the direct impact on the home country labour market. Yet as most international migrants were working before and will work during and after their migration episode, it seems logical that migration impacts the labour market. While debate rages as to whether rich country migration policies generate a brain drain in developing countries, relatively little has been researched with respect to the labour consequences for sending countries when workers leave. At the heart of this argument is a development-relevant question first posed by Sjaastad (1962): how effective is migration in equalizing inter-regional earnings of comparable labour?

This paper sets out to add a piece to this policy puzzle. It takes as a departure point the fact that many empirical papers have focused on immigration to developed countries estimating the impact of immigration on various indicators of the labour market: wages and unemployment but also informal employment and even crime. Relying on the most standard depiction of a labour market, one with two countries, the neoclassical model predicts that if one country increases its labour force (and as a consequence decreases wages), the mirror country experiences a decrease in its labour force and consequently an increase in average wages.

Dustmann *et al.* (2005) refine the argument above by adding two factors that influence whether and by how much a change in the labour force will alter the labour market. The first is a direct change in skill composition of the labour force, an effect via the labour supply. We would expect an impact on the labour market if the skill composition of migrants (for both cases of emigration and immigration) differs from the composition of the native work force. The second factor is an indirect effect affecting the demand for labour. The output mix of tradable goods and the level of international openness of a country will determine whether and how quickly a country's labour market readjusts to its long term equilibrium. For instance, the labour market of a relatively closed economy with little variety in exported goods will likely experience long term alterations in its labour market equilibrium when facing a change in its labour force, while a relatively open economy with a high output mix will revert back to its original labour market equilibrium in the long run and rather adjust through it mix of exported goods.

The simplified neoclassical model above provides us with a motivation to answer a basic question: do wages increase when members of the labour force leave the country? According to the framework elaborated by Dustmann *et al.* (2005), the laws of supply and demand have rather unambiguous implications, but the effect can theoretically range from zero to very large. This paper looks at the short run (2001-2007) but posits that labour markets in Honduras are likely affected in the long run, due to its middle-of-the-road ranking in openness[4], its low output mix and its inability to appropriately replenish and retain its high-skilled work force.

To answer the question, this paper turns to the empirical foundations of Borjas (2003), which investigated a similar question but with respect to immigration. Borjas' approach was to use long term (census) data for immigration to the US and divide immigrants into groups based not only on education,

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[4] KOF Index of Globalization, available at http://globalization.kof.ethz.ch/.

but also on years of work experience, thus forming what he called *skill groups*. While education groups might show little variation over time, when combined with experience, the immigrant supply shock on the US per different *skill group* displays decidedly more variation which can be exploited to identify the impact of immigration on labour market indicators; the key being identifying the *most likely* migrant that could theoretically substitute for a native in the host country labour force. A second reason to use this approach is that mobility between skill groups is lower than mobility over space, a departure from previous studies which exploited the spatial correlation of immigration.

III. A Review of the Literature

A good basis for the understanding of the impact of emigration on the labour market is the growing body of micro-oriented work. The reaction of a household facing a decrease of labour force within its internal stock has been the focus of recent research partly inspired by the growing availability of household surveys in developing countries and a collection of recent anecdotal experiences. Studies such as Macharia (2003) on Kenya and Ennaji & Sadiqi (2004) on Morocco, for instance, mention the importance of the loss of workers in migrant sending regions and its impact on the labour participation of left-behind household members as well as on the productivity of the household as a unit (particularly for rural households).

This empirical literature attempts to answer two questions. The first is whether non-migrant household members change their labour supply following the emigration of a fellow household member and the second is why. The general conclusion is that, in the short term, emigration will increase labour supply in the household, but it may eventually decrease it if in turn remittances are expected from the migrant – thus relaxing various financial constraints on the household. Conclusions in this literature are mixed but four key messages can be synthesized: households operating in rural and urban labour markets will react differently (Damon, 2009; Görlich *et al.*, 2007), men and women will react differently (Cabegin, 2006; Carletto and Mendola, 2009; Glinskaya and Lokshin, 2009), individuals with different levels of education will react differently (Rodriguez and Tiongson, 2001) and informal employment will increase, notably because entrepreneurial activities are undertaken with the use of remittances and also because women shift their work to more flexible working arrangements to be closer to home – particularly if the household has young children (Görlich *et al.*, 2007; Yang, 2008).

So how do the conclusions in the micro-oriented work above translate in the aggregate? This is a relatively recent question posed by econometricians and left incompletely answered.

One approach has been to see if emigration contributes to wage convergence between sending and receiving countries, in the long run. In the case of Europe, research shows that emigration contributed to real wage convergence towards that of richer countries by decreasing the growth of the labour force (Boyer *et al.*, 1993; Williamson, 1996). The recent East-to-West migration experience of the European Union accession countries has also provided a good natural experiment in observing the impact of the loss of labour. In reviewing the Lithuanian experience, Thaut (2009) notes that the free movement of workers has helped relieve pressure on the domestic labour market, drive down unemployment and push wages upward, although this has caused major labour shortages in certain sectors. In rapidly growing economies like Romania, the simultaneous incompatibility of the outflow of workers in the

midst of growing demand for labour has forced the country to turn to immigration to compensate for the gap (Silasi and Simina, 2007).

Another approach to answering this question, commonly used to estimate the impact of immigration on labour market outcomes, is to exploit variation in the labour force due to the inherent change in the supply of labour. These studies are grounded in the predictions depicted in the neoclassical labour market model. Many studies focusing on immigration exploit the spatial differences in immigration, comparing labour market outcomes between regions based on the amount of immigrants working in each region (see for instance Card, 2001; Dustmann *et al.*, 2005; Pischke and Velling, 1997).

Other research takes inspiration in a body of work on the national impact of immigration, notably on the aforementioned Borjas (2003). Apart from his use of *national* data on the US labour market, as opposed to the use of smaller geographical segments of the American labour market common in previous studies[5], the novelty in Borjas (2003) is that he divides workers by education level and by years of work experience[6]. The variation in the size of these groups over time is exploited to identify the impact on the labour market outcome of interest. With this approach a closer comparison of the potential substitutability between immigrants and native workers is obtained. Comparing high school graduates with respectively 30 and 5 years of experience each on the labour market, for instance, is likely not realistic.

The conclusions above blur an important aspect of the dynamic governing the links between emigration and labour markets. The impact will depend on which skill group we focus on. Elasticities are averaged by skill group, but the debate on brain drain suggests that some skill groups are more affected than others. As suggested by Dustmann *et al.* (2005), the size of the impact depends on the difference between the skill distribution of emigrants and the skill distribution of the labour force left behind. Because many high-skilled workers leave developing countries, but also because developing countries typically have lower stocks of high-skilled migrants to replace them, upward pressure on wages is strongest as we move up education levels.

Fewer papers have looked at the impact of *emigration* exploiting the variation in the departure of skill groups over time although anecdotal evidence provided by Silasi and Simina (2007) and Thaut (2009) suggest that wages do increase. Studies that have estimated the impact of emigration using a similar framework to Borjas (2003) include Mishra (2007), Aydemir and Borjas (2007), Borjas (2008) and Bouton *et al.* (2009); they conclude that emigration increased wages in Mexico, Puerto Rico and Moldova

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[5] Decaluwé and Karam (2007) furthermore confirm Borjas' claim that internal migration will obfuscate the impact of migration on labour markets. Focusing solely on regional changes could hide the impact of emigration if the jobs left behind by emigrants were subsequently taken by other workers in Honduras from other regions. The net impact in this case would be zero; internal migration may wipe out any positive impact in the medium-to-long run, hence the need to have a national view of the labour market. Another advantage of Borjas' approach is that it solves a problem that has dogged the spatial correlation approach: native workers may react to the change in labour supply due to emigration by migrating internally. Mobility between skill groups is less habitual than spatial mobility.

[6] To be clear, the level of analysis is not the individual, the household or different countries but rather the skill group.

respectively. The elasticities for these studies range from 2% to 6% (a 10% increase in emigration leads to 2% to 6% increase in wages)[7].

In light of the conclusions on specific countries above, the next section will provide background information on emigration and the labour market in Honduras.

IV. Background on Honduras

IV.1 Emigration from Honduras

Until recently, emigration from Honduras was relatively low in comparison to neighbouring countries and largely spurred by regional conflict. The combination of economic growth and the devastation caused by Hurricane Mitch in October 1998 ignited a wave of emigration from Honduras. Honduras, along with Nicaragua, took the brunt of the Hurricane and as a response, the US granted Hondurans that were in the US at the time of the hurricane[8] temporary protected status (TPS); such protection covered Hondurans without legal papers and prevented their detainment, deportation and enabled them to legally work in the country. This protection continues to this day[9].

Slowly, migration has crept into the Honduran policy-making agenda. Almost concurrently, the Honduran government began drafting their Poverty Reduction Strategy Paper (PRSP) with the IMF. While the initial 2001 version of the Honduran PRSP did not incorporate international migration into the country's poverty reduction strategy, progress reports in 2003 and again in 2005 saw an increase of references to emigration and remittances in the document as potential tools for development[10].

Moreover, in relation to other developing countries, and unlike its Guatemalan and Salvadoran neighbours, Honduras has established very few bilateral and multilateral migration agreements. In 2006, it signed a repatriation program with Mexico[11] and signed a VISA waiver agreement with its neighbours (the CA4 agreement)[12]. In 2007, a small temporary migration programme began with Canada and in 2008 discussions began for a temporary labour migration agreement with Spain. Nonetheless, most

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[7] Mishra (2007), Aydemir and Borjas (2007) and Borjas (2008) all take a very long term approach, while Decaluwé and Karam (2008), Hanson (2007) and Bouton *et al.* (2009) use shorter periods. Since migration is an adaptable phenomenon, the point at which a country finds itself in the migration cycle will surely influence the impact it has on wages. Social groups (*ie.* Hometown Associations, HTAs), households, regions and countries have different ways of coping with emigration and remittances depending on the length of time since migrants have left the home country. Moreover and as pointed out by Dustmann *et al.* (2005), while there may be impacts in the short term, so long as the distribution of skills between migrants and non-migrants is different, the long term effects depend on the openness and output mix of the country. Using a slightly modified approach to exploit regional differences in Mexico, Hanson (2007) also arrives at a similar conclusion. While the elasticity derived in Hanson (2007) is higher, the author warns that the number includes both direct and indirect effects (emigration's impact on growth) of emigration and therefore likely overvalues the true elasticity. In their simulation exercise based on a 1998 social accounting matrix of Morocco, Decaluwé and Karam (2008) also find that the direction of the effect is positive.

[8] Hondurans living in the US had to provide proof of continuous residence in the US since December 30, 1998 and continuous physical residence since January 5, 1999.

[9] US Citizenship and Immigration Services, www.uscis.gov.

[10] Poverty Reduction Strategy Papers for Honduras can be downloaded at http://www.imf.org/external/np/prsp/prsp.asp#H.

[11] Revised and updated in October 2010.

[12] With El Salvador, Guatemala and Nicaragua.

emigration flows continue to be towards the US and are still lower than countries with similar socio-economic backgrounds.

Emigration from Honduras since Hurricane Mitch has been intensive. Table 1 below shows the evolution of emigrant stocks of Hondurans in the US based on US Census and American Community Surveys from 1960 to 2008[13].

Table 1: Number of Individuals Born in Honduras Living in the USA
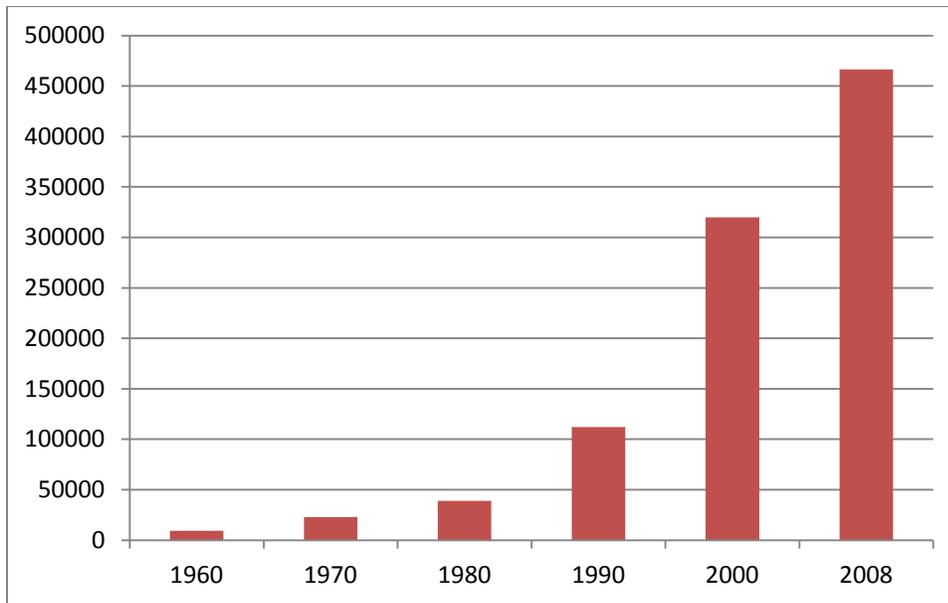
Source: Census and American Community Surveys (IPUMS), tabulated by author

The largest increase in this table occurs in the decade following 1990. However, there is reason to believe that this increase is less pronounced than appears in this table. The reason is that the US census bureau began better tracking unauthorised immigrants in 2000 with the American Community Surveys (ACS). The ACS is the primary statistical tool used by the US Department of Homeland Security to estimate the numbers of unauthorised immigrants. According to the Department of Homeland Security, Honduras had the highest relative increase of any country of irregular migrants from 2000 to 2009; the number of unauthorized immigrants born in Honduras to the US between those years increased by 100% (Baker *et al.*, 2010). Between those years the unauthorized population in the US born in Honduras rose from 160 000 to 320 000, while the next biggest percentage increase came from Guatemala with 65%. Irregular migration is an increasingly frequent characteristic of Latin American migrants; for many of these countries, the people residing irregularly in the US represent more than 50% of the total immigrant stock from the home country[14].

Thus it is reasonable to say that the figures for 1990 in Table 1 are likely higher than they should be; alternatively, we can say that the numbers reported after 2000 are less underreported than those prior.

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[13] A comparable plot for the years in this study (2001, 2004, 2007) shows a similar trend.
[14] Using different sources, Borowik *et al.* (2009) show a much steeper increase between 2000 and 2006.

The intensity of emigration from Honduras is remarkable. In fact, according to the 2006 American Community Survey (ACS), 87% of all Honduran emigrants had emigrated in the 10 years prior (CEMLA, 2008) and by 2006, more than 11% of households had at least one migrant abroad (BID, 2008). According to Borowik *et al.* (2009), the increase in emigration from Honduras also saw the most rapid growth of all Latin American countries. This fact has not gone unnoticed back home; the Honduran Association of Maquiladoras, which relies heavily on cheap national labour, has been pushing a campaign in Honduras with the slogan '*quedate con nosotros'* in response to their inability of retaining workers in Honduras. Despite the rapid increase in emigration, the stock of Honduran emigrants in 2005 as a percentage of home country population (5.8%) is lower than both Mexico (10.7%) and Morocco (8.6%) (World Bank, 2008) – a sign that Honduran emigration was relatively low in prior years in comparison to many other countries.

The US is the primary destination for Honduran migrants; 91.4% of Hondurans abroad lived in the US in 2006, while the remainder was scattered among Mexico, Spain, Canada and other countries in Central America (Borowik *et al.*, 2009). This number of Hondurans in the US was estimated to be as high as 95% in 2007 (CEMLA, 2008).

A study by the Inter-American Development Bank (BID, 2008) also shows that in 2006, 70% of emigration from Honduras was undertaken by men (mostly husbands and sons) with relatively low education (59% had at most completed primary education or lower) and age (65% of emigrants were between the ages of 15 and 29). The Statistical Institute of Honduras (INE) adds that 91% of Hondurans abroad in 2008 had emigrated to seek employment. While two thirds of emigration before 1997 originated from urban regions, in 2006 the split between rural and urban was close to 50% (CEMLA, 2008).

Despite being of relatively low-skill in comparison to emigrants from other countries and the native workforce, the rate of the emigrated tertiary educated population in Honduras around 2000 (21.8%) was noticeably higher than in both Mexico (14.3%) and Morocco (10.3%).[15] This reflects the low numbers of educated individuals back home. In contrast, brain drain of medical workers was relatively low from Honduras in 2000. According to the World Bank (2008), 1.1% of medical workers had emigrated from Honduras, while this number was 4.1% for Mexico and from between 7% and 31% (depending on sources used) for Morocco.

IV.2 The Labour Market in Honduras

Honduras is a poor country. Its population of just fewer than 8 million inhabitants is larger than neighbouring Nicaragua and El Salvador and about half the number in Guatemala. GDP/capita is low at just over USD $4000, somewhere in the middle of the Central American ranking; in 2006, 60% of Honduran households were living under the poverty line (ISACC, 2009). Its human development index[16] is typically amongst the lowest in the region.

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[15] World Bank (2008).
[16] http://hdr.undp.org/en/statistics/

It would also be difficult to characterize the Honduran labour market as a functional and integrated one. Precarity in the labour market is on the rise (ISACC, 2009). Informal employment is the norm for most of the population and the labour market is highly segmented which in effect limits movement between formal and informal labour markets. As a comparison, the share of the labour force informally employed between 1995 and 2006 ranged from 66% to 71%, while these shares were 54% to 58% for Mexico (IILS, 2009). According to the ISACC (2009) report, 62% of Hondurans were self-employed in 2006. There are many reasons for this, notably a lack of sustained demand for formal labour and a large agricultural sector, but also a complex minimum wage structure. From 1990 to 2004, 22 different minimum wages were applied in Honduras, defined by firm size, industry and, for some years and location (Gindling & Terrell, 2010). Another reason is that registering and running a formal venture is not easy in Honduras. Honduras has regularly ranked behind all other economies in Central America in the World Bank's Doing Business ranking[17]. As is typical in poor countries, where employment determines subsistence and social security is nearly inexistent, unemployment rates are low. In 2006, the unemployment rate in Honduras was around 3%, after falling for several years with a high of around 6% in 2004 (CEMLA, 2008). However, the active labour force in Honduras is also low. The ratio between the number of individuals working or looking for work over the number of individuals old enough to work was 55% in 2006 (CEMLA, 2008).

While internal migration was a typical feature of the Honduran labour market in the 1980s and 1990s, it has progressively given way to international migration (UNAT-UNFPA, 2006); rural-to-urban migration, in particular, has decreased. Recalling that Decaluwé and Karam (2007) found that any impact on the Moroccan labour market due to emigration was obfuscated by internal and international immigration and that Morocco had an individual-lifetime internal migration rate of 33.4% of the working age population between 1990 and 2005 (World Bank, 2008), in Honduras, the percentage of individuals living outside their major administrative unit (region) in comparison to total population was 17.2% in 2001[18] (ECLAC, 2007). Moreover, approximately 56% of the population in Honduras still lived in rural regions in 2000; in Mexico this figure was 25%, in Puerto Rico 5% and in Morocco 47% (UN, 2008). By 2005, these figures had not changed by much except in Puerto Rico where it dropped to 2%. Concern is also warranted on the direction of flows. Both emigration and immigration simultaneously impact wages in opposite directions. This was the conclusion of Borjas (2008) using Puerto Rican data. However, immigration into Honduras is low relative to the native population (the stock of immigrants made up 0.4% of the population in 2005) and is unlikely to have a distinguishable impact on the labour market[19]. In contrast, immigrants in Puerto Rico made up 9% of the population in 2005[20].

In terms of industries, Honduras is highly concentrated in both exports and trading partners, although it is slowly diversifying. In 2001 its Herfindahl-Hirschmann index was nearly 0.20 but had decreased by

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[17] http://www.doingbusiness.org/.

[18] While the figure for Morocco concerns only the working age population, recalculating it on the basis of the entire population would still yield a much higher rate of internal migration than Honduras.

[19] In fact, Honduras has one of the lowest immigrant stocks in the world (UN, 2008).

[20] United Nations, Department of Economic and Social Affairs, Population Division (2009). Trends in International Migrant Stock: The 2008 Revision.

more than half by 2005, a figure closer to its Latin American neighbours[21]. Exports are concentrated on coffee and banana, amongst other commodities. As such, most low-skilled labourers work in these sectors. Over 70% of these exports reach the US, a figure which has not changed for many years, making it one of the highest export-concentrated countries by destination in Latin America (OECD, 2007). 36% of the working population is involved in agriculture and livestock farming [followed by commerce (18%) and manufacturing (15%)]; the agricultural sector also experienced the highest growth (34%) between 2001 and 2006 (ISACC, 2009). The manufacturing sector is dominated by the maquiladora system, the third largest of its kind in the world. It employs approximately 130 000 Hondurans (CEMLA, 2008). Women have increasingly found work in the maquiladoras industry. In addition, the public sector is relatively small (5.6%).

Formal and compulsory education in Honduras begins at the age of 6 and ends at the age of 12, in what is called '*basica*' or primary education. It is free and paid by the public system. Secondary education is divided in two. From the age of 12 to 15, students attend the '*ciclo comun*' and follow-up with another two years in '*ciclo diversificado*' (age 15-17). Beyond this, students can attend technical school (age 16-19) or enter university. According to the ISACC (2009) report, 71% of the population had not progressed further than primary education by 2006.

The conclusions derived from the neoclassical labour market model assume a competitive labour market. In light of this, how competitive is the labour market in Honduras? Marred by incomplete labour markets in rural regions, segmented formal and informal labour markets as well as between rural and urban regions, high under-employment with a large reserve army of workers, the labour market in Honduras can be summarized as dysfunctional. In light of this, it is interesting to investigate whether emigration can produce a discernible effect on the labour market.

V. Empirical Framework

V.1 Empirical Specification

The identification strategy of this paper follows the one developed by Borjas (2003). The theoretical foundation of Borjas (2003) supposes a very simple supply and demand framework suggesting that increases (decreases) in domestic labour supply due to migration lead to a decrease (increase) in local wages. Looking at Honduras, this would mean that a decrease in labour supply should lead to an increase in wages, for specific education-experience (skill-) groups. This paper follows this literature and exploits differences across skill groups in the Honduran labour force and emigrant flows to the US for 2001, 2004 and 2007.

The baseline estimated equation is as follows:

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[21] The Herfindahl-Hirschman Index (HHI) is a measure of the size of firms in relation to the industry and an indicator of the amount of competition among them. It is calculated with the following formula: $H = \sum_{i=1}^{n} s_i^2$ where s_i is the market share of firm i in the market and N is the number of firms. As such, a low HHI can be interpreted as a sign of a highly competitive economy. Because prices are often used to calculate a HHI, economies based primarily on commodity exports are often subject to variations in their HHI which do not necessarily reflect changes in the competitive nature of their economy but rather changes in the price of the exported commodity; this may explain, to a certain degree, the drop in HHI value for Honduras.

$$w_{ijt} = \delta m_{ijt} + s_i + v_j + \pi_t + (s_i * \pi_t) + (v_j * \pi_t) + (s_i * v_j) + \varepsilon_{ijt} \tag{1}$$

where w_{ijt} represents the mean monthly wage for education group i, experience group j in year t. m_{ijt} is the emigrant supply shock from Honduras to the US in cell (i, j, t) and is measured as follows:

$$m_{ijt} = \frac{M_{ijt}}{N_{ijt}} \tag{2}$$

where M_{ijt} is the number of Honduran emigrants in the US in cell (i, j, t) and N_{ijt} is the national labour force in Honduras in group (i, j, t). This is a key departure from Borjas (2003) who, in addition to native workers, also includes immigrants in the denominator. As we are interested in departed migrants, it is sufficient to calculate the ratio between Honduran emigrants and the labour force left in Honduras, without including the number of emigrants in the denominator. m_{ijt} measures the emigrant share of the labour force in a particular skill group and in a particular year.

s_i, v_j and π_t are vectors for specific group fixed effects while $(s_i * \pi_t)$, $(v_j * \pi_t)$ and $(s_i * v_j)$ are their respective interaction terms. The first two interaction terms control for the fact that the profile of returns to education and experience might change over time, while the last term controls for the possibility that the profile of returns to experience changes between different education groups. Economy-wide shocks are captured by the time fixed effect.

The parameter of interest is δ which gives the percentage change of wage given a 1% change in emigrant shares. Because the group size, on which data for wages is derived, varies, the regressions are weighed by the size of the labour force (N_{ijt}).

The equation can also be estimated in differences to remove any possible time invariant components of the model:

$$\Delta w_{ijt} = \delta \Delta m_{ijt} + \Delta s_i + \Delta v_j + \Delta \pi_t + \Delta(s_i * \pi_t) + \Delta(v_j * \pi_t) + \Delta(s_i * v_j) + \Delta \varepsilon_{ijt} \tag{3}$$

where the Δ's represent the difference in the variables at the (i, j, t) level between two years.

Finally, as the data used in this paper is rich repeated microdata, in addition to the skill group regressions, the paper also estimates the equation using an individual-level wage regression. Individual micro data increases significantly the number of observations, and thus the accuracy. The equation is specified as follows:

$$w_{nt} = \delta m_{ijt} + \beta X_{nt} + \pi_t + \varepsilon_{nt} \tag{4}$$

where w_{nt} represents the mean wage for individual n in year t. m_{ijt} is the emigrant supply shock from Honduras to the US in the cell (i, j, t) in which the individual belongs; it is measured in the same way as in the group level regressions. βX_{nt} is a vector of standard individual characteristics susceptible of determining an individual's wage. Individual controls are included such as marital status, education level

and working experience in years[22]. Interaction terms of these variables are also included with the year dummy to control for intertemporal changes in the control variables. The ε_{nt} term is also clustered at the *ijt* level.

The impact of emigration can also be estimated by "spatial correlation", that is, by exploiting the variation of immigration by geographical entity. Although it would be interesting to contrast this method with the others, the lack of data on emigration by year in Honduras does not permit it.

VI. Data and Summary Statistics

Because the vast majority of Hondurans abroad are in the US (>90%), it is acceptable to use data from the US only. Data on individuals born in Honduras and living in the US are drawn from microdata samples of the American Community Surveys (ACS) for the years 2001, 2004 and 2007. The ACS is a statistical survey tool initiated in 2000 by the US Census bureau, collecting similar information as in the standard decennial census, on approximately 250 000 nationally representative American households on a monthly basis. It gives a good approximation of irregular migrants in the US. The survey is the most advanced survey in the US for tracking immigrants as it asks for the state or country of birth, U.S. citizenship status, the year of U.S. entry and the place of residence one year ago. However, it is likely that the ACS still underestimates the number of unauthorized workers entering the United States. The data used in this paper were obtained from Integrated Public Use Microdata Samples (IPUMS) USA Project and are 1/232nd, 1/239th and 1/100th random draws from the original data respectively.

An emigrant is defined as a person over the age of 15 and under the age of 66 born in Honduras and living in the US according to the ACS; this definition does not depend on naturalization or on whether the migrant is in a regular (*ie.* legal) situation or not. At the age of 16, individuals can legally work in almost all US states[23].

Table 2 below shows the size of the emigrant supply shock for Honduras by education groups. Between 2001 and 2007, the aggregate shock increased by about 5 percentage points, but the changes varied widely between education groups. As pointed out, a major difference between Honduras and Mexico is the level of brain drain and the ACS data confirm the magnitude, although the magnitude of the brain drain is decreasing with time. Recent immigration to the US is characterized by low-educated individuals, but the relative distribution changes drastically when taking the point of view of the sending country. Unsurprisingly, the greatest labour shocks for the Honduran labour market were in the two most educated groups. This is largely because the labour force of lower educated individuals in Honduras is relatively larger than those with higher education; as a result, even though there may be less high educated individuals emigrating from Honduras in absolute terms, the relative quantitative importance of this group vis-à-vis the group of similar workers left in Honduras is much higher.

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[22] While the standard wage regression stipulates adding occupation and industry control variables, it makes little sense to add these in the context of emigration. Most emigrants, even high-skilled ones, will change occupation and sometimes industry once in the host country. Therefore it is difficult to match individuals to occupations and industries between two countries like Honduras and the US.

[23] US Department of Labor, www.dol.gov.

Table 2: Number of Emigrants by Total Number Left in Honduras, by Education
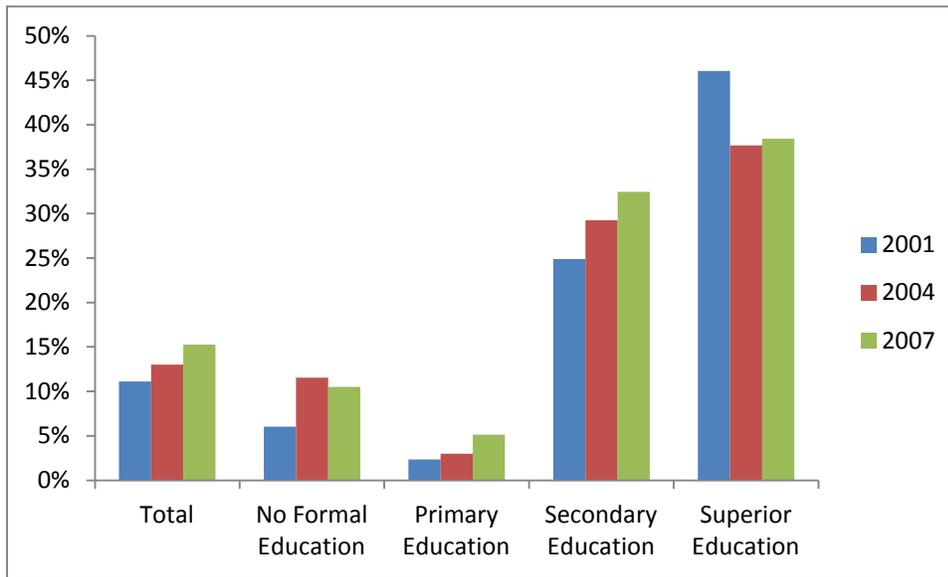
To demonstrate the level of variation between years of experience, Table 3 plots years of experience from 0 to 51 by education level and by year. It is clear by comparing the three tables that the distribution changes year to year. This variation is key in identifying an impact from emigration on wages.

Table 3: Variation in Years of Experience of Honduran Emigrants, by Education (2001, 2004, 2007)
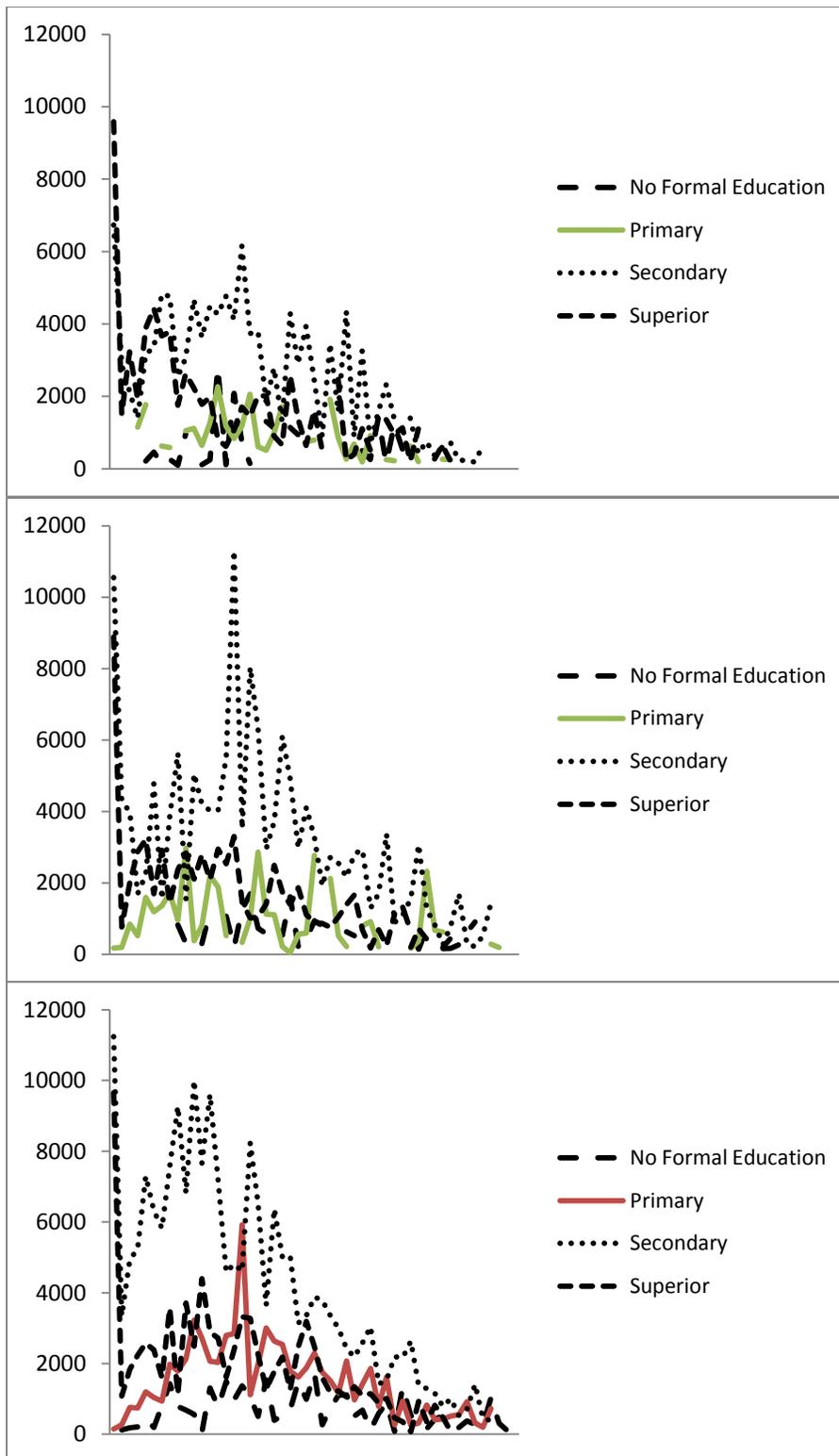
The data used to obtain the size of the Honduran labour force and average wages in Honduras come from the *Encuesta Permanente de Hogares de Propositos Multiples* (EPHPM) (translation: *multi-purpose permanent household survey*), a biannual (May and September) nationally representative household

survey for the years 2001, 2004 and 2007. The EPHPM is administered by the Honduran National Statistical Institute (INE) since 1990. It provides a range of individual information such as gender, education, year of birth and rural/urban location. While in some years the data is missing or incomplete, the years 2001, 2004 and 2007 had complete data for both May and September surveys, except for September 2004[24] for which I complement with another source. Sample sizes vary substantially, from around 36000 individuals in May 2001, May 2004 and September 2004 to over 80000 in September 2001, May 2007 and September 2007. Because this may affect the accuracy of the averages, weights are used in the regressions.

A member of the labour force in Honduras is defined as a person over the age of 15 and under the age of 66, working or looking for work in Honduras according to national household surveys. The survey questions asked were "In the last week, did you dedicate at least one hour for an activity for which you were paid" and "In the last week, did you search for paid employment?" An individual part of the labour force was defined as a person answering yes to either one of these questions, which are standard ILO-defined questions typically used to count the labour force. It is notable that the definition of wages and the labour force used in this paper includes, to an extent, informal employment; as pointed out earlier this is a key characteristic of the Honduran labour market.

Individuals in the sample are divided into schooling and experience groups. There are four education groups corresponding to (a) no education (less than 6 years of schooling completed), (b) primary education (at least 6 but less than 13 years of schooling completed), (c) secondary education (at least 12 but less than 17 years of schooling completed) and (d) post-secondary education (more than 16 years of schooling completed). Because information on work experience is not available in the surveys, it is estimated using Age-AT, where AT is the assumed age of entry into the labour market. For those without education or primary education, AT=16; for those with secondary education, AT=18 and for individuals with a post-secondary degree, AT=22. This assumption is largely crude. By definition, the approximation includes the assumption that individuals enter the labour force immediately after completion of their studies. It also assumes that experience for men and women can be approximated in the same way, which is not always the case – childbearing and childrearing affect women more than men in terms of their experience profile. Table 3 below provides details on the total labour force for each education category. Overall, the labour force grew over the time period in question, but not for those without any education and mostly for those with primary and secondary education.

To match this information with the two databases (from two different countries), the following was done. In the EPHPM survey, individuals that declared their highest educational level being 'none', 'an alphabetisation programme' or 'pre-basica' were categorized as 'without any level' ('SNI'). Individuals that declared their highest education level as 'basica' were categorized as 'primary education' ('PRI'). Those who declared 'ciclo comun' or 'diversificado' were categorized as having 'secondary education' ('SEC') and finally those with 'tecnico superior' or anything higher, regardless of whether they completed their university studies, were categorized as having a 'superior' ('SUP') education level. To

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[24] From August to November 2004, a similar but wider household survey took place under the name *Mejoramiento de las Encuestas y Medición de las Condiciones de Vida* (MECOVI) survey project in many Latin American countries, including Honduras. In this paper, the MECOVI survey is used to extract data for September 2004.

match this with the American Community Survey (ACS) data, I did the following. Individuals with at most nursery or kindergarten education were categorized as having no formal education. Individuals with their education level at most grade 1 to grade 6 (included) were slated as having 'primary education'. Individuals with education levels ranging from grade 7 to grade 12 (including General Education Diplomas diplomas) were categorized as 'secondary education' and all individuals with any higher form of education were categorized as having 'superior education'.
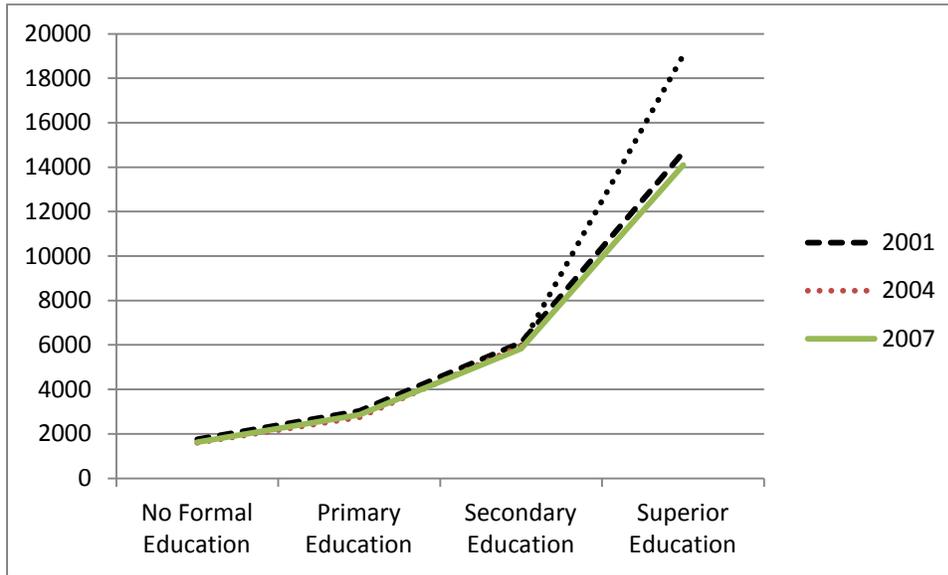
Table 4: Honduran Labour Force, by Education Level
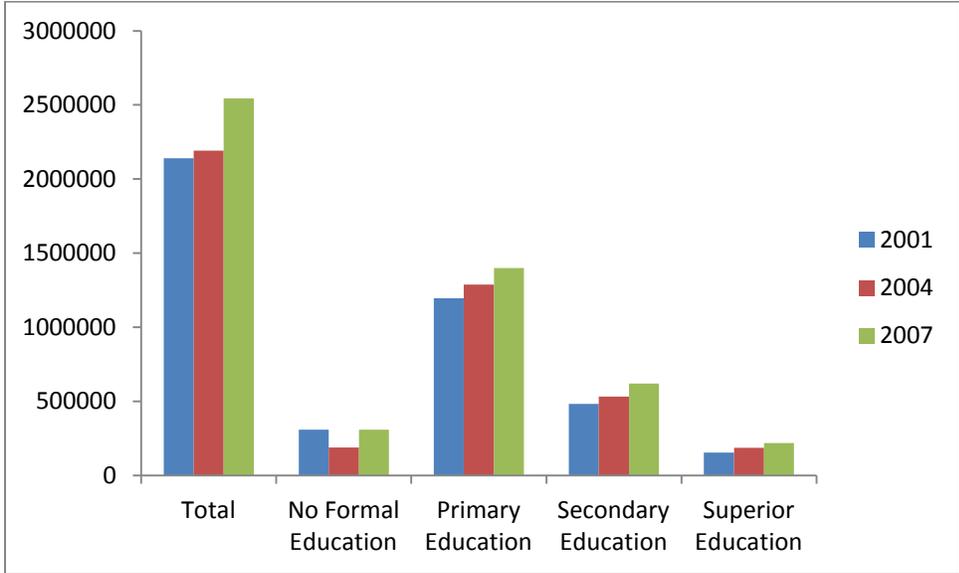
Source: Encuesta Permanente de Hogares de Propositos Multiples (EPHPM), tabulated by author

Average wages are calculated by taking the average monthly wages between May and September for each skill group using the EPHPM. Wages are defined as the sum of monthly monetary or in-kind income, including self-employment. The average of both months is used to avoid biases due to seasonal labour demand. Tables 5 and 6 show the changes over time and by education group. Wages increase with education level, but did not grow between 2001 and 2007. In fact, while they grew for the period 2001-2004 for the highest educated group, they returned to their initial level by 2007. This is consistent with the drop in emigration rate for this group (table 2) and a gradual movement to the right of the educational distribution in the country (table 3).

Table 5: Real Wages (base=2005) by Education Group and Year

Source: Encuesta Permanente de Hogares de Propositos Multiples (EPHPM), tabulated by author

Table 6: Real Wages (base=2005) by Education Group and Year
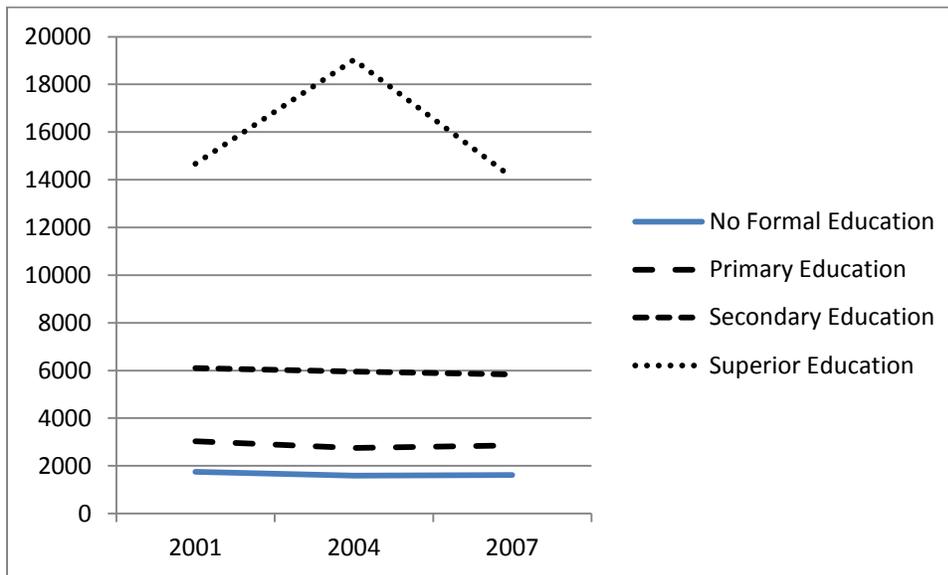
Source: Encuesta Permanente de Hogares de Propositos Multiples (EPHPM), tabulated by author

A final table of interest, and possibly the most important, is the difference between the distribution of migrants and the distribution of the labour force remaining in Honduras, over time and by education group. As pointed out by Dustmann *et al.* (2005), we would expect little or no change, even in the short run if the distributions were similar. However, different distributions in the two groups would warrant, at least in the short run, a change in the equilibrium of the labour market. It is clear that the group leaving Honduras has a different distribution than those staying behind. The majority (>50% in all three years) of emigrants fall in the secondary schooling category, with superior education ranking second.

The labour force in Honduras however, has relatively little secondary (about half) and superior (about one third) educated individuals in comparison. While these differences are shrinking over time, the low output mix and the low openness of the Honduran economy means that in the long run, the labour market will take the brunt of the impact from emigration. Conversely, the incomplete and segmented labour market in Honduras might suggest a small, indiscernible impact.

Table 7: Educational Distribution, Emigrants and Non-emigrant Labour Force in Honduras

2001					
Education	None	Primary	Secondary	Post-Secondary	Total
Left-behind LF	14.4%	55.8%	22.5%	7.2%	100%
Emigrants	7.8%	11.8%	50.5%	29.9%	100%
2004					
Education	None	Primary	Secondary	Post-Secondary	Total
Left-behind LF	8.6%	58.7%	24.3%	8.5%	100%
Emigrants	7.6%	13.4%	54.5%	24.5%	100%
2007					
Education	None	Primary	Secondary	Post-Secondary	Total
Left-behind LF	12.1%	54.0%	24.4%	8.6%	100%
Emigrants	8.3%	18.4%	51.7%	21.6%	100%

Source: American Community Surveys (IPUMS) and EPHPM, tabulated by author

VII. Results

This section will present results derived from the model presented in Section IV.

The basic regression results, shown in Table 8, estimates δ from equation (1), which gives us the effect of emigration on the wages in Honduras and considers only emigrants who left for the US after the age of 15. In total there are 612 different groups (4 education groups x 51 experience groups x 3 years), weighed by the labour force in each group. There is a tradeoff between weighing or not. Weighed regressions add more importance to average wages that contain more values thus increasing its measured precision. However, by weighing the groups by their labour force we are not reaching the full distribution of skill groups equally, likely according less importance to those at the upper level of both education and experience.

The first specification is presented in column 1 the most basic, which includes a fixed effect for education, experience and time. Specification II includes education and experience interaction terms with time, and the last specification includes all fixed effects and all interaction terms. The first two specifications show that there is a positive and statistically significant link between emigration of Honduras to the US and wages in Honduras. The last column shows a positive relation but is not significant, which suggests that the effect on wages is absorbed by the fact that the returns to

experience differs between the different education groups and not on the emigrant shock. This may also be due to the large amount of fixed effect variables in the model since experience groups are counted by 1-year intervals and due to weighing, which limit the data as discussed earlier.

Table 8: Basic Results

Estimated Effect of Emigration on Wages in Honduras (2001, 2004, 2007)

Dependent Variable: Average Real Monthly Earnings (in logs) in schooling-experience-time cell (i, j, t) in Honduras			
	I	II	III
Ratio of the number of emigrants (>age 15) to the workforce in Honduras in cell (i, j, t)	0.23***	0.27***	0.12
schooling, experience and time fixed effects	yes	yes	yes
interaction between schooling and time fixed effects	no	yes	yes
interaction between experience and time fixed effects	no	yes	yes
interaction between schooling and experience fixed effects	no	no	yes

Table 9 considers alternative regressions and shows the results for all three specifications. The first row shows regression results without weighing the groups by the labour force in the group. The effect is smaller but the third specification is now significant reflecting the fact that, without weighing the full distribution of skill groups receives equal weight.

The second test runs the regression with all emigrants, regardless of the age they were when they left for the US. The effect is still positive and significant, but less than in Table 8.

The final two rows show regression results from using only one of the months rather than averaging the two. The effect is different in both cases, although still positive, and mostly significant. The higher elasticity found in May is expected since wages, particularly those of low-skilled workers, seasonally increase in September and October when it is coffee-picking season in Honduras and labour demand increases.

Table 9: Robustness Tests

[Variable of interest: Ratio of the number of emigrants to the workforce in Honduras in cell (i, j, t)]

Estimated Effect of Emigration on Wages in Honduras (2001, 2004, 2007)

Dependent Variable: Average Real Monthly Earnings (in logs) in schooling-experience-time cell (i, j, t) in Honduras			
	I	II	III
unweighed regression (emigrants > age 15)	0.13***	0.16***	0.14***
all emigrants	0.15***	0.20***	0.10
only May (emigrants > age 15)	0.21***	0.25***	0.12
only September (emigrants > age 15)	0.10**	0.19***	0.07
schooling, experience and time fixed effects	yes	yes	yes
interaction between schooling and time fixed effects	no	yes	yes
interaction between experience and time fixed effects	no	yes	yes
interaction between schooling and experience fixed effects	no	no	yes

As alluded to earlier, the micro literature on emigration and labour markets suggests quite strongly that labour market outcomes will vary by gender and whether the labour market is rural or urban. Table 10 shows results using only men's, women's, urban and rural average wages, but keeping the emigration shock consistent. This places a strong assumption on the model that vacant jobs can be replaced by either gender or geographical location without discrimination on unobserved factors and follows from the assumption made earlier that the relevant labour market is national.

The impact is positive and significant but stronger for women than it is for men. This suggests that perhaps the scarcity of workers in Honduras may be contributing to an increase in wages and jobs for women. It may also be a sign of positive self-selection on the part of women. Female labour supply curves differ from men's and it may be the best "able" (or other unobservable characteristic) women entering the labour market, as opposed to a fuller range for men. It is conceivable that the departure of workers abroad and the resulting decrease of labour supply in Honduras is pushing more women to jump on opportunities and enter the labour market. In the latter case, the results would be biased upward.

Similarly, urban labour markets have a strong and positive impact but the impact in rural labour market is close to zero, consistent with the argument that labour markets work less efficiently in rural areas. In fact when not weighed, the regressions yield a negative and significant elasticity. It is also consistent with the Lewis labour market model; wages are not increasing by as much in rural regions because jobs are not being replaced with the unfolding of a rural-urban labour transition. When the labour market is constrained to only the rural labour market (as opposed to a full national labour market), the impact is positive but small. In addition, it is noteworthy that maquiladoras are found in urban regions.

These regressions also show that women workers and urban labour markets are driving the results in Table 8.

Table 10: Specific Groups in the Labour Market

Estimated Effect of Emigration on Wages in Honduras (2001, 2004, 2007)

Dependent Variable: Average Real Monthly Earnings (in logs) in schooling-experience-time cell (i, j, t) in Honduras			
	I	II	III
only men (in Honduras), emigrants > age 15	0.11*	0.13**	0.09
only women (in Honduras), emigrants > age 15	0.21***	0.30***	0.06
only urban (in Honduras), emigrants > age 15	0.17***	0.22***	0.08
only rural (in Honduras), emigrants > age 15	0.00	0.06	0.00
schooling, experience and time fixed effects	yes	yes	yes
interaction between schooling and time fixed effects	no	yes	yes
interaction between experience and time fixed effects	no	yes	yes
interaction between schooling and experience fixed effects	no	no	yes

Table 11 below shows regression results from the individual regression model following equation (4), and including a typical set of labour market controls. Again, results are strong, positive and significant.

Table 11: OLS Regression Based on Individual Data

Estimated Effect of Emigration on Individual Wages in Honduras (2001, 2004, 2007)

Dependent Variable: Real Monthly Earnings (in logs) of Individual Workers in Honduras		
Ratio of the number of emigrants to the workforce in Honduras in the worker's ijt cell	0.24***	(0.03)
Controls:		
urban (=1)	0.79***	(0.01)
male (=1)	0.22***	(0.01)
married (=1)	0.08***	(0.01)
experience	0.24***	(0.00)
experience squared	0.00	(405.94)
primary education (=1)	0.47**	(0.02)
secondary education (=1)	1.03**	(0.02)
superior education (=1)	1.81**	(0.03)
Number of Observations	113761	
R-squared	0.33	

A key identification issue in this paper is the endogeneity between migration and wages. Wages can also be the determining factor for migration as an increase or a decrease in local wages might spur the outflow of workers. For this reason, the paper also presents results from a 2SLS instrumental variable regression in Table 12 for the grouped regressions.

The instrument used relies on the convincing literature linking migration and social networks (*ie.* Munshi, 2003). Because migration is a costly investment, through their role in lowering the costs associated with emigrating (through information sharing, loans, know-how, experience), social networks foster migration by effectively lowering the cost associated with bureaucracy, settlement and job search. Social networks have been used as an instrumental variable strategy when dealing with emigration since they are correlated with migration yet uncorrelated with wages. 1990 was a time when emigration rates from Honduras were low. The hurricane contributed to destroying capital in the country and as a consequence and in many ways, reset the labour market and forced many Hondurans to search for work abroad. As such, social networks before Hurricane Mitch hit should not be correlated with labour market variables in Honduras afterwards.

As such, this paper turns to the size of each cell in the US in 1990. Groups of people often associate themselves as well as their employment opportunities through skill groups. Similarly educated individuals tend to associate themselves with other individuals of the same education level for many reasons: similar income levels, similar neighbourhoods, similar job prospects, similar entertainment. Naturally, individuals tend to be friends with individuals of the same status.

Table 12 shows the IV results based on a 2SLS strategy where the IV is the size of each (*i, j*)[25] group in 1990. The elasticities are now much larger than without the instrument, with an elasticity of 1.21 and significant at the 1% level[26]. The individual groups follow a similar trend as before, with women and urban regions experiencing the highest impact. A similar impact, although much lower, is presented below in Table 13 for the individual regression, using the same instrumental variable strategy.

Table 12: Group Regression with Instrumental Variable

Estimated Effect of Emigration on Wages in Honduras (2001, 2004, 2007)

Dependent Variable: Average Real Monthly Earnings (in logs) in schooling-experience-time cell (*i, j, t*) in Honduras		
	weights	no weights
all workers, emigrants > age 15	1.21***	1.04***
only men (in Honduras), emigrants > age 15	0.81***	0.48*
only women (in Honduras), emigrants > age 15	1.61***	1.43***
only urban (in Honduras), emigrants > age 15	1.31***	1.23***
only rural (in Honduras), emigrants > age 15	0.64*	-0.09
schooling, experience and time fixed effects	yes	yes
interaction between schooling and time fixed effects	no	no
interaction between experience and time fixed effects	no	no
interaction between schooling and experience fixed effects	no	no

Table 13: Individual Regression with Instrumental Variable

Estimated Effect of Emigration on Individual Wages in Honduras (2001, 2004, 2007)

Dependent Variable: Real Monthly Earnings (in logs) of Individual Workers in Honduras		
Ratio of the number of emigrants to the workforce in Honduras in the worker's *ijt* cell	0.35***	(0.00)
Controls:		
urban (=1)	0.11***	(0.00)
male (=1)	0.03***	(0.00)
married (=1)	0.13***	(0.00)
experience	0.00***	(0.00)
experience squared	0.00**	(0.01)
primary education (=1)	0.08***	(0.00)
secondary education (=1)	0.07***	(0.00)
superior education (=1)	0.15***	(0.00)
Number of Observations	113 753	
R-squared	0.16	

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[25] As there is only one year, *t* is dropped from the notation.
[26] Tests for the validity of the instrument were performed.

Because only one side of the regression equation is in log form, we can interpret the results above by calculating the wage elasticity with respect to labour supply as follows:

$$\frac{\partial log\ w_{ijt}}{\partial m_{ijt}} = \frac{\delta}{(1+\Delta m_{ijt})^2} \qquad (6)$$

The left-hand side equation is an identity, representing the elasticity of labour supply with respect to wages. δ is obtained from the regression results, and Δm_{ijt} is the change in emigrant-to-labour force ratio between 2001 and 2007.

To calculate by how much emigration decreased the labour force in Honduras between 2007 and 2001, Δm_{ijt} is calculated by:

$$\Delta m_{ijt} = \frac{M_{2007}}{N_{2007}} - \frac{M_{2001}}{N_{2001}} \qquad (7)$$

Between these two years, emigration had decreased the labour force of Honduras by about 4.2%. To calculate the elasticity, we need to multiply δ by 0.92[27], which in the most basic regression model in Table 8 yields approximately 2.1%. Following the same logic, the result from the 2SLS model yields an increase of 11%. This can be interpreted by stating that a 10% shift in emigration leads to an 11% increase in wages in Honduras. The 2SLS model yields a result that is more than twice the size found by Mishra in Mexico.

VIII. Conclusion

This paper deals with a migration topic which has largely not been investigated: the impact of emigration on wages. Taking data from Honduras and the US for the years 2001, 2004 and 2007 it finds that a 10% increase in emigration led to an increase of about 17% of wages in Honduras during this time period.

The results above provide evidence on the direction and size of the impact of migration on the wages. They suggest that the direction of the impact is clearly positive. Because of Honduras mediocre ranking in openness, its low output mix and its inability to appropriately replenish and retain its high-skilled work force, the impacts on the labour market due to emigration are likely to remain in the long run, possibly contributing to rising inequality.

The political fallout in June 2009 combined with the major school strikes throughout the year and the devastation of the tourism industry cemented the fact that, at least in the short-to-medium term, emigration from Honduras will continue to climb[28].

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[27] $\frac{1}{(1.042)^2}$

[28] After months of seeing its economy sink as a result of the global recession, Honduras endured an internationally condemned coup d'état in June of 2009, which forced then President Manuel Zelaya to step down. The coup contributed to Honduras' further economic decline with a fall in international trade, investor enthusiasm, financial loans and even official development assistance. Moreover, a combination of union-mandated teacher strikes and general uncertainty resulted in an estimated 100 school days lost during the entire academic year (Business Week, June 29, 2009; The Americas Society, June 28, 2010, www.latamthought.org).

As global migration "demand" will continue to rise in the coming years, a clear understanding of its implications, notably for development, is warranted. This paper has attempted to narrow the knowledge gap on emigration and development by providing evidence of the links between emigration and the labour market. Amidst slogans in Honduras from the Honduran Association of Maquiladoras (HAM) calling for potential emigrants to "stay with us", it is a relevant political issue. The conclusions of this paper suggest that emigration generates a redistribution of wealth from capital to labour. The HAM likely sees emigration as a threat because it must pay workers higher salaries as a result. As such, at least from a global distribution point of view, the *'stay with us'* slogan – which focuses on the dangers and risks of migration – appears to be biased. This paper has shown that, for some workers, the emigration of workers other than themselves may have a positive effect on their employment wages. In fact, as this paper suggests, the wages are likely increasing for HAM as workers leave the country, putting the HAM in a position of weaker negotiation. At a more macroeconomic point of view, the paper has contributed evidence that in the long run, emigration may help developing countries converge economically towards richer countries.

The policy recommendation of this paper is not necessarily to open all borders or facilitate departures; a usually empty policy agenda difficult to implement. The message is rather twofold. First emigration increase wages but differently and at different paces depending on who leaves based on skill groups. This has consequences. It leads to an increase in inequality favouring groups relatively less abundant in Honduras. It also leads to a national redistribution in Honduras from capital to labour. The second message is that we need to consider the full range of effects when making reforms on the labour market; emigration and the labour market go hand –in-hand.

It is more typical to find evidence linking the impact of a change in wages on the labour supply. In some cases however, internal policy (China, Vietnam, the West Bank) or conflict (Colombia) have provided experiments outside of migration to test the reverse elasticity. The impact found in this literature is typically small, such as in the West Bank where it was found that the increase in labour supply due to labour mobility constraints lowered local wages by about 2% for low-skilled workers (Mansour, 2010).

An important finding in this paper is that wages increase more for women than for men; women in Honduras appear to benefit more from the outmigration or workers. It is hard to argue that this is a result from the low entry into the labour market of women, leading to lower competition; female labour participation, according to the EPHPM data, is increasing faster than men. Moreover, the regression model considered men's and women's labour market to be the same. These results seem to suggest an increasing presence of women in the Honduran economy.

This paper has also highlighted a few shortfalls. In light of the low internal migration in some countries, it would be a valuable exercise to estimate the impact of emigration on the labour market using the spatial correlation approach and compare with the results found above (equation 5). Unfortunately, countries do not track information on those who leave the country and therefore, while we may estimate the aggregate emigrant shock on the labour market, we cannot, as is done in the literature on immigration, estimate differences between regions based on emigration intensity.

Another shortfall is on the impact due to remittances[29]. Emigration creates a feedback process through remittances, and these remittances also impact how households, and consequently the labour market adjusts to migration. In the lone known study, Kim (2007) shows that remittances increase unemployment in Jamaica. Adding remittances in the framework above has little sense because remittances are primarily a household variable. Because the framework in this paper uses a skill group level analysis, there is no reason to believe that remittances sent from a certain skill group should impact the labour choices of the same skill group in Honduras.

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[29] The question dealt with in this paper is strongly linked to the debate on the clear differentiation between the impact of emigration and the impact of remittances on labour outcomes. The loss of a worker might imply reallocation of household labour to replace the former contribution of the departed member, while remittances might imply investment in more productive assets (less labour-intensive assets) or perhaps a decrease in the necessity to work in lowly productive or dangerous activities. Both will have an impact on labour participation. It is difficult to predict where this tradeoff lies and the relative importance of one over the other. Because the effects are linked with time, panel data can be a powerful tool for disassociating the two different impacts.

IX. References

Aydemir, Abdurrahman Bekir & G.Borjas (2007), "A Comparative Analysis of the Labor Market Impact of International Migration: Canada, Mexico and the United States," *Journal of the European Economic Association*, Vol. 5(4), pp. 663-708.

Baker, Bryan, M.Hoefer & N.Rytina (2010), "Estimates of the Unauthorized Immigrant Population Residing in the United States: January 2009," Office of Immigration Statistics, Policy Directorate, U.S. Department of Homeland Security.

Berry, Albert & R.Soligo (1969), "Some Welfare Aspects of International Migration," *The Journal of Political Economy*," Vol.77(5), pp.778-794.

BID (2008), "Tendencias en las migraciones y remesas internacionales en los paises de America Central y la Republica Dominicana," Banco Interamericano de Desarrollo (BID), Tegucigalpa, Honduras, pp.17.

Bouton, Lawrence, S.Paul & E.R.Tiongson (2009), "The Impact of Emigration on Source Country Wages: Evidence from the Republic of Moldova," World Bank, mimeo.

Borjas, George (2003), "The Labor Demand Curve is Downward Sloping: Reexamining the Impact of Immigration on the Labor Market," *Quarterly Journal of Economics*, Vol.118(4), pp. 1335-1374.

Borjas, George (2008), "Labor Outflows and Labor Inflows in Puerto Rico," *Journal of Human Capital*, Vol. 2(1), pp. 32-68.

Borowik, Kamil, I.Endo, S.Hirsch & J.Rogge (2009), "The U.S.-Honduras Remittance Corridor: Acting on Opportunities to Increase Financial Inclusion and Foster Development of a Transnational Economy," World Bank Working Paper No.177, World Bank, Washington.

Boyer, George, T.Hatton & K.O'Rourke (1993), "The Impact of Emigration on Real Wages in Ireland 1850-1914," CEPR Discussion Papers 854, CEPR Discussion Papers.

Cabegin, Elena (2006), "The Effect of Filipino Overseas Migration on the Non-migrant Spouse's Market Participation and Labor Supply Behavior," IZA Discussion Paper Series 2240, Institute for the Study of Labor, Bonn, Germany.

Card, David (2001), "Immigrant Inflows, Native Outflows, and the Local Labor Market Impacts of Higher Immigration," *Journal of Labor Economics*, University of Chicago Press, Vol. 19(1), pp. 22-64, January.

Carletto, Gero & M.Mendola (2009), "International Migration and Gender Differentials in the Home Labor Market: Evidence from Albania," Development Working Papers 272, Centro Studi Luca d'Agliano, University of Milano.

Damon, Amy (2009), "Household Labor Allocation in Remittance-Receiving Households: The Case of El Salvador," mimeo.

Decaluwé, Bernard & F.Karam (2008), "Migration Impact on Moroccan Unemployment : a static computable general equilibrium analysis," Documents de travail du Centre d'Economie de la Sorbonne bla08052, Université Panthéon-Sorbonne (Paris 1), Centre d'Economie de la Sorbonne.

Dustmann, Christian, F.Fabbri & I.Preston (2005), "The Impact of Immigration on the British Labour Market," *The Economic Journal*, 115(November), F324-F341.

ECLAC (2007), "Social Panorama of Latin America: Chapter 4," ECLAC, Santiago, Chile, pp.40.

Ennaji, Moha & F.Sadiqi (2004), "The Impact of Male Migration from Morocco to Europe on Women: A Gender Approach," *Finisterra*, Vol.39(77), pp.59–76.

FONAMIH (2008), "Balance Migratorio: Honduras 2008," Foro Nacional para las Migraciones en Honduras, Semana del Migrante, Tegucigalpa, Septiembre.

Gindling, Tim & K.Terrell (2010), "Minimum Wages, Globalization, and Poverty in Honduras," World Development, Vol. 38(6), pp.908-918.

Glinskaya, Elena & M.Lokshin (2009), "The Effect of Male Migration on Employment Patterns of Women in Nepal," *World Bank Economic Review*, Vol. 23(3), pp. 481-507.

Görlich, Dennis, T.O.Mahmoud & C.Trebesch (2007), "Explaining Labour Market Inactivity in Migrant-Sending Families: Housework, Hammock, or Higher Education?" Kiel Institute for World Economy, Kiel Working Papers No. 1391.

Hatton, Timothy (2007), "Should We Have a WTO for International Migration?" *Economic Policy*, Vol. 22(4), pp.339-383.

Hanson, Gordon (2007), "Emigration, Labor Supply, and Earnings in Mexico," Chapter in Mexican Immigration to the United States, pp.289-328.

IILS (2009), "International Institute for Labour Studies Informality Database," International Labour Organization, Geneva.

ISACC (2009), "Estudio sobre el mercado laboral y su relacion con la probreza en Honduras, Guatemala y Nicaragua," Instituto Sindical Para America Central y el Caribe (ISACC), Managua, Nicaragua, pp. 61.

Kim, Namsuk (2007), "The Impact of Remittances on Labor Supply: The case of Jamaica," Policy Research Working Paper Series 4120, The World Bank, Washington DC.

Macharia, Kinuthia (2003), "Migration in Kenya and Its Impact on the Labor Market," Paper prepared for Conference on African Migration in Comparative Perspective, Johannesburg, South Africa, June 4-7.

Mansour, Hani (2010), "The Effects of Labor Supply Shocks on Labor Market Outcomes: Evidence from the Israeli-Palestinian Conflict," University of Colorado Denver, mimeo.

Mishra, Prachi (2007), "Emigration and Wages in Source Countries: Evidence from Mexico," *Journal of Development Economics*, Vol. 82(1), pp. 180-199.

Munshi, Kaivan (2003), "Networks in the Modern Economy: Mexican Migrants in the U.S. Labor Market," *The Quarterly Journal of Economics*, MIT Press, Vol. 118(2), pp. 549-599.

OECD (2007), "Chapter 4: Trade for Development," in *Latin American Economic Outlook 2008*, Paris, pp.189.

Pischke, Jörn-Steffen & J.Velling (1997), "Employment Effects of Immigration to Germany: An Analysis Based on Local Labor Markets," *The Review of Economics and Statistics*, MIT Press, Vol. 79(4), pp. 594-604.

Rodriguez, Edgard R. & E.R.Tiongson (2001), "Temporary Migration Overseas and Household Labor Supply: Evidence from Urban Philippines," *International Migration Review*, Vol. 35(3), pp. 709-725.

Ruggles, Steven, T.Alexander, K.Genadek, R.Goeken, M.Schroeder & M.Sobek (2010), Integrated Public Use Microdata Series (IPUMS): Version 5.0 [Machine-readable database]. Minneapolis: University of Minnesota, available at http://usa.ipums.org/usa/.

Silasi, Grigore & O.L.Simina (2007), "Romania, a Country in Need of Workers? The Bitter Taste of Strawberry Jam," MPRA Paper 14855, University Library of Munich, Germany.

Sjaastad, Larry A. (1962), "The Costs and Returns of Human Migration," *The Journal of Political Economy*, Vol.70(5), pp. 80-93.

Thaut, Laura (2009), "EU Integration & Emigration Consequences: The Case of Lithuania," International Migration, Vol.47(1), pp.191-233.

UN (2008), "World Urbanisation Prospects: The 2007 revision population database," available at http://esa.un.org/unup/.

UNAT-UNFPA (2006), "Migración, Mercado de Trabajo y Pobreza en Honduras," UNAT-UNFPA, Honduras.

UNDP (2009), "Human Development Report 2009: Overcoming Barriers - Human Mobility and Development," UNDP, New York, pp.217.

Williamson, Jeffrey G. (1996), "Globalization, Convergence, and History," *The Journal of Economic History*, Cambridge University Press, Vol.56(02), pp.277-306.

World Bank (2008), "Migration and Remittances Factbook," Washington DC, pp.240.

World Higher Education Database (WHED), International Association of Universities, Paris, France, available at http://www.whed-online.com/.

Yang, Dean (2008), "International Migration, Remittances and Household Investment: Evidence from Philippine Migrants' Exchange Rate Shock," *The Economic Journal*, Vol.118(528), pp.591-630.