Distortions in the International Migrant Labor Market:
Evidence from Filipino Migration and Wage Responses to Destination
Country Economic Shocks[*]

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Abstract
We use an original panel dataset of migrant departures from the Philippines to identify the responsiveness of migrant numbers and wages to GDP shocks in destination countries. We find a large, significant response of migrant numbers to GDP shocks at destination, but no significant wage response. This is consistent with binding minimum wages for migrant labor. This result implies that labor market imperfections that make international migration attractive also make migrant flows more sensitive to global business cycles. Difference-in-differences analysis of a minimum wage change for maids confirms that minimum wages bind and demand is price sensitive without these distortions.

Keywords: international migration, migrant demand, labor output elasticity, minimum wages.
JEL codes: O12, J23, F22.

1. Introduction

The global market for labor has some of the largest distortions of any factor market (Clemens, 2011). The same worker can earn very different wages depending on in which country they work (Clemens et al, 2009; McKenzie et al. 2010). As a result, moving from a poor country to a rich country to work is perhaps the single act most likely to succeed in dramatically increasing an individual's income, as well as that of remaining family members (e.g. Cox-Edwards and Ureta, 2003; Yang 2008; Gibson et al. 2013). In recognition of this fact, a number of developing countries have put in place policy measures to help their citizens work abroad. The government of the Philippines has been on the forefront of promoting overseas temporary contract work and making emigration part of its national development strategy, and many other developing countries are now seeking to emulate the Philippines in this regard.

However, the recent global financial crisis has highlighted the potential vulnerability of migrant jobs to economic conditions in destination countries. Emigration to Ireland from the new European Union states fell 60 percent from 2008 to 2009, while overall European Union flows to Spain fell by two-thirds. Inflows to the United States fell in almost all legal temporary work categories, including a 50 percent decline in visas issued to low-skilled seasonal workers (Papademetriou et al, 2010). Net migrant outflow from Mexico to the U.S. was only 0.09 percent of the Mexican population in 2010-11, compared to 0.53 percent in 2006-7 (Rodriguez, 2011). Moreover, despite these responses at the extensive margin (the number of migrants), immigrant employment rates among those who do migrate or remain abroad are more sensitive to the business cycle than the employment rates of natives (Orrenius and Zavodny, 2009).

A key contribution of this paper is to show that the high vulnerability of migrant jobs to economic shocks is intimately tied to the large gains in wages that migration offers. The extent to which migration flows respond to shocks at

destination depends on the output elasticity of demand for migrant labor and on the extent to which wage adjustment can occur through movements along the migrant labor supply curve. However, estimating this responsiveness in the context of bilateral migration flows is complicated by concerns that economic shocks also affect the migrant origin country, thereby also shifting the labor supply curve and preventing identification of the labor demand impact. In addition, reliable microeconomic data on migrant flows and the wages these migrants earn are extremely rare. We overcome both issues by using a unique database which has information on all new work contracts issued to Filipino workers over the 1992 to 2009 period, including information on the destination country and contracted wage.

The Philippines provides an excellent setting to examine how migration responds to shocks at destination. It was the first country to implement temporary overseas contract work on a wide scale, and Filipinos now migrate in large numbers to a very diverse set of countries, which have experienced substantial heterogeneity in macroeconomic conditions over the period of our data. In 2007, 1.7 million Filipinos were working outside of the Philippines in 181 countries, with overseas contract work the primary channel of emigration.

Using these data, we estimate how the number of contract workers and the wages they are paid respond to economic shocks in destination countries. We find a strong and significant positive relationship between migrant numbers and GDP fluctuations at destination, with the point estimate suggesting migrant quantities respond more than one-for-one to proportional GDP changes. In contrast, we find that the wages migrants are paid has no large or statistically significant relationship with GDP changes at destination. This pattern is consistent with the existence of binding minimum wages that lead to migrant labor supply exceeding labor demand at the contracted wages. This occurs for both low- and high-skilled workers, suggesting the distortion comes not just from national minimum wages

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in destination countries, but also from restrictions on the wages that migrants of higher skill levels can be paid. For example, the United States H1B program that many IT professionals and foreign professors use to work in the United States requires that employers pay the "prevailing wage" obtained from a salary survey, as do a number of other immigration categories in the U.S.; Australia requires employers to pay their overseas workers the market salary rate and on top of this, specifies a threshold (currently A$49,330) that skilled migrants must make;[1] and the Philippines' bilateral labor contracts require workers to be paid the prevailing wage for their positions in the destination countries. As a result, the same market imperfection that is one reason that workers can so dramatically increase their incomes by working abroad shifts all the burden of adjustment to demand shocks onto quantities rather than wages.

As supporting evidence that minimum wages bind and to help rule out alternative explanations, we also consider the impact of a 2006 law change that raised the mandated minimum wage for overseas Filipinos working as domestic helpers (maids). We use difference-in-difference analysis to show that this change led to a decline in the number of Filipinos going as domestic helpers to low wage destinations, relative to those going as domestic helpers in higher wage countries and to those going to low wage destinations in other worker categories. In addition, we show that this increase in the minimum wage for domestic helpers lead to increases in contracted wages for such workers. This evidence from the single largest occupational category supports the claim that minimum wages bind, and helps rule out concerns that workers and employers might be able to circumvent any regulations by writing a contract for one wage and in practice working for a different wage. The result of such a minimum wage increase is to increase even further the gap between supply and demand for migrant labor,

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[1] See http://www.immi.gov.au/skilled/temporary-skilled-migration-threshold.htm (accessed October 18, 2011).

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thereby ensuring migrant numbers will remain vulnerable to economic shocks at destination.

The remainder of the paper is structured as follows: Section 2 describes the institutional setting and labor market for Filipino overseas workers, and its implications for modeling labor adjustment to GDP shocks at destination. Section 3 describes our new database. Section 4 provides the main results, highlighting the response of migrant numbers and wages to GDP shocks, and examining heterogeneity in these responses. Section 5 carries out difference-in-difference analysis of a change in the minimum wage for domestic helpers to bolster our case for a binding minimum wage, by showing that quantities fall and wages rise when this minimum wage is increased. Section 6 concludes and discusses implications for migration as a development strategy.

2. Institutional Setting and Labor Market for Filipino Overseas Foreign Workers

2.1 Institutional Setting

As the first country to implement temporary overseas contract work on a wide scale, the Philippines provides a particularly relevant setting for testing the sensitivity of migration to global economic shocks. In 1974, the Philippine government began the Overseas Employment Program to aid Filipinos in finding work overseas due to poor economic conditions in the Philippines. Since the program's inception, Filipino migration has increased dramatically, and Filipinos now migrate in large numbers to an extraordinarily diverse range of destination countries. The top ten destinations account for approximately 86 percent of all new overseas Filipino worker (OFW) hires (see Table 1). Countries such as Saudi Arabia, the U.A.E., and Kuwait, in the Middle East, and Japan, Hong Kong, Taiwan, and Singapore in East Asia are the most common destinations, but Italy, the U.K., Canada and the U.S. are also among the top fifteen destinations. By comparison, 98 percent of Mexican migrants are in the United States (World

Bank, 2011). Migration from the Philippines is largely temporary and legal, and occurs through licensed private recruitment agencies. Overseas temporary contract work is the primary channel through which Filipinos migrate, and in order to be cleared to leave the Philippines, an OFW must have a job contract in hand. Between 1992 and 2000, 83 percent of Filipinos abroad were engaged in contract work,[2] with most of the rest being non-temporary workers migrating through family reunification policies or other permanent migration channels. This form of legal temporary work is likely to become more common in future years as countries like Bangladesh, Indonesia, Nepal, Sri Lanka and India seek to follow the Philippine model, and destination countries consider how to balance demands for labor with public concerns about migrant settlement.

2.2 Large Potential Supply

Data from the 2010 Gallup World Poll suggest that there are many individuals in the Philippines who would like to work abroad but who are not currently doing so. This poll asked a representative sample of 1000 adults in the Philippines the question "Ideally, if you had the opportunity, would you like to go to another country for temporary work, or not?" Overall, 51.1 percent of adults aged 15 and over said they would like to work abroad in temporary work (and 18.6 percent said they would like to migrate permanently abroad). Desire to migrate temporarily abroad is highest for individuals in the 15-34 age range, for individuals in urban areas, and for more educated individuals. The voting age population (18+) in the Philippines is approximately 52 million, so taking 51 percent of this gives approximately 26 million people who say they would like to migrate temporarily. This is ten times the magnitude of the 2.0 million who actually did work abroad as overseas foreign workers in 2010.[3] Even allowing for

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[2] Authors' calculation from the Survey of Overseas Filipinos (SOF), an offshoot of the Labor Force Survey in the Philippines.
[3] http://www.census.gov.ph/data/pressrelease/2011/of10tx.html [accessed July 19, 2011].

the likelihood that many more people express an interest in migrating abroad than would actually migrate if given the opportunity, these numbers still suggest large interest in migration.

Our qualitative interviews with employment agencies in the Philippines also support the notion of excess supply; it is common to hear reports that the market for overseas contract labor "is a buyer's market." In particular, they note that the emergence of Bangladesh, India, Indonesia, Sri Lanka, and Pakistan as competing labor-sending countries has made it more difficult for them to find jobs for Filipinos.

2.3 Wage Setting and Minimum Wages

The Philippine Overseas Employment Administration (POEA) regulates the recruitment and employment of Filipinos for work abroad. Their rules and regulations dictate that there be "guaranteed wages for regular work hours and overtime pay, which shall not be lower than the prescribed minimum wage in the host country or not lower than the appropriate minimum wage standards set forth in a bilateral agreement or international convention, if applicable, or not lower than the minimum wage in the country [the Philippines], whichever is highest."[4] This rule effectively sets a minimum wage for legal overseas work, since the Philippines Government will not process work contracts which have wages set at a level below that set out in this law. Such minimum wage setting for overseas migration is a direct result of the 1974 Philippine Labor Code and was instated for the primary purpose of ensuring that overseas workers are not exploited or discriminated against (Philippine Labor Code, 1974).[5]

In practice only some of the host countries for Filipino workers have their own minimum wages that apply to foreign labor. Thus, for example, Filipino

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[4] http://www.poea.gov.ph/rules/POEA%20Rules.pdf [accessed July 19, 2011].
[5] OFWs are often quite vulnerable. For instance, in 2011, welfare assistance, such as psychological counseling, legal assistance, and conciliation, was provided to 268,026 overseas workers (OWWA Annual Report, 2011).

workers in the United States, Canada and Korea are covered by minimum wage laws in those countries, whereas other destinations like Saudi Arabia, the United Arab Emirates, Qatar, Bahrain, Oman, and Malaysia do not have minimum wage laws. Yet, as will be discussed below, although they do not have minimum wage laws, the immigration laws of most of these countries require migrants to be paid wages no less than those offered to nationals, effectively imposing a minimum wage for migrants. Furthermore, for a number of destination countries, the Philippine Government negotiates bilateral agreements, which in some cases set additional minimum wage requirements.

As stipulated in POEA's Rules and Regulations, prior to deployment of an OFW, work contracts must be verified by the Philippine Overseas Labor Offices (POLOs) to ensure that the contract conforms both with the minimum standards set forth by POEA and the labor laws and legislation of the host country. For each occupation, POLOs determine the prevailing market wages in the host country and will not approve contracts that set wages below these levels.[6] Thus even more skilled occupations, whose incomes are above the Philippine minimum wage and above the overseas minimum wage for low-skilled occupations, still have limits on how low their contracted wages can be. In addition to these steps, in 2006 the Philippine government enacted the Household Service Workers Reform, which set a universal minimum of US$400 for overseas work in the domestic service sector. We examine the impact of this reform in Section 5 below.

A natural question is then whether these minimum wages set by the Philippines are enforced. It appears that for the most part they are. Since the establishment of the POEA in 1982, there has been some system for employees to file complaints if contracted wages are not received. This system of complaints

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[6] To determine prevailing market rates, POLO officers use available information from both the government and private sector in the host country as a reference. They also refer to rates previously approved by POEA for the destination country and occupation (POEA Deputy Administrator Liberty Casco, personal correspondence, 2013).

was formally written into law with the passage of the Migrant Workers Act of 1995 (RA 8042) by the Congress of the Philippines. It was amended in 2010 (RA 10022) and maintains regulations for enforcement of wages.

In the event that an OFW does not receive his or her contracted wages, he or she can file a complaint against the employer and the recruiting agency. The POLO initially tries to settle the dispute directly between the employer and worker. If this is unsuccessful, there is a dispute settlement in the labor courts of the host country. Should this procedure fail, POEA tries to resolve the dispute with the recruiting agency through internal conciliation services. As a last resort, the worker can file a claim against the recruiting agency in the Philippine labor courts. In addition to monetary punishment including the payment of contracted wages as well as fines, recruitment agencies with labor contracts found to be in violation may face other sanctions such as having their operating licenses suspended or cancelled.

OFWs are widely aware of the procedures surrounding contract disputes. As part of their mandatory Pre-Departure Orientation Seminar (PDOS), OFWs receive information about their rights and responsibilities within their employment contract and what to do in the case of contract violations. In addition to a large Legal Assistance Fund for migrant workers, the president of the Philippines appoints a Legal Assistant for Migrant Workers to assist with these contract violations. Additionally, Philippine embassies and POLOs in common destination countries have 24-hour resource centers providing legal services.

2.4 Quotas, wages, and migration policies around the world

Although there is no global database of migration policies which details which countries impose migration quotas or minimum wage restrictions on migrants, there have been a couple of attempts by international organizations to examine these issues. A review by the OECD (2006) found that "migration quotas per se tend to be the exception in OECD countries" (p. 113) but that in contrast "in many

OECD countries, work permits for potential cross-border recruits are subject to an employment test" (p. 114). For example, Japan, Canada, Australia, Greece, Belgium, Finland, and France were some of the OECD countries with no quotas during the period of our study, relying on labor market tests and/or points systems. These employment tests typically require employers to show that there is no qualified candidate available to fill the job, and can require advertising the job first to natives at the prevailing wage.

A more systematic and comprehensive effort occurred via an ILO (2004) survey which surveyed migration policies at that time, getting replies from 93 member states. While one-third of countries replied that they had specific quotas for migrant workers admitted for certain reasons, these were almost always partial in nature, applying only to certain sectors or types of firms, such as quotas for seasonal workers or, in some countries, restrictions at an enterprise level on a maximum ratio of foreign to local workers. The only country in our sample that had a national level quota is Switzerland, which has quotas on the number of non-EU nationals entering. Moreover, quotas were not always binding. For example, the United States has no quotas, only a labor market test, for seasonal agricultural workers coming under the H2A policy; has a quota of 66,000 seasonal non-agricultural workers coming in under the H2B policy which has not been met in many years; and a quota for high-skilled temporary workers coming under the H1B policy which was not filled between its establishment in 1990 and 1997, or between 1999 and 2002, but has been filled since then (OECD 1998, NFAP, 2010).

In contrast, the vast majority of countries use a labor market test requiring employers to show that there is a lack of qualified applicants and/or requiring that migrant workers be offered a wage no less than the prevailing wage offered to nationals in that occupation. In the ILO survey, 84 percent of countries reported such a requirement, and the only countries in our study's sample that didn't report

having that requirement were Saudi Arabia and Singapore. However, Singapore does charge employers of low and medium-skilled workers a monthly levy for each foreign worker employed, with this levy ranging from US$123 to US$362 per month (Yeoh and Lin, 2012), which acts to increase the effective wage paid by employers of foreign workers. These labor market tests and requirements that migrant workers be offered a wage no less than that of nationals often occur alongside any partial quotas countries may have, and can be a reason quotas do not bind.

As a result of these policies, there is effectively a minimum wage that needs to be paid to be able to bring a migrant worker into most countries, with the labor market test requirement meaning this minimum wage varies with occupation and skill level. Thus when we refer to minimum wages, we are referring to a more general phenomenon than is typically considered in the labor literature, which focuses on a single minimum wage that is the least every worker must be paid. In the Philippines migration context, minimum wages can vary by destination country, skill level, and occupation.

2.5 Model of the Labor Market and Response to GDP Shocks Abroad

Clemens et al. (2009) estimate that a low-skilled Filipino worker would earn 3.5 to 3.8 times as much working in the U.S. as they do in the Philippines, even after accounting for differences in costs of living. However, the wages Filipino workers are paid for the same occupation differ a great deal across destination countries. For example, in 2005, domestic helpers earned a median monthly wage of $1,527 in Australia versus $200 in Malaysia. Similarly, production workers in the United Kingdom in 2005 earned $1,742 per month, whereas in the United Arab Emirates, the corresponding figure was only $275.

A model of the migrant labor market should explain why (a) there is variation across destinations in the wages migrants earn; and (b) more people don't migrate despite the much higher wages to be earned abroad. We consider three potential

models of the labor market that might explain these facts, and consider the implications of each for the response to a GDP shock in the destination country.

Market clearing model

The most basic model is one in which the labor market clears in each destination country, and the higher wages earned abroad are just enough to offset workers' disutility of leaving their home country and spending time away from family, with this disutility varying across destination countries. In such a model, a positive output shock in the destination country will shift out the labor demand curve, leading to an increase in wages and an increase in the quantity of migrants. However, this model is not realistic for several reasons. First, it does not accord with the evidence for excess supply of migrants and institutional rules on wages detailed above. Second, it would require that migrants experience much less disutility going to Saudi Arabia (which has relatively low wages) than Canada (which has relatively high wages), which does not accord with the preferences migrants give when asked about destinations. This is particularly the case for destinations in the Middle East, in which mostly Christian Filipino workers often experience difficulties in practicing their religion. The same critique would apply for explanations based on a flat (perfectly elastic) labor supply curve: it would require migrants to prefer low-wage destinations in the Middle East to Canada, Europe, and the U.S., requiring an offsetting higher wage premium to overcome the disutility of going to these locations.

A more likely model therefore includes distortions which prevent the migrant labor market from clearing, and which lead to wages above the level which would equate supply and demand for migrant labor. The two most probable sources of distortions are minimum wage requirements and quotas. We discuss each in turn.

Binding minimum wages

The discussion above of how wages are set through bilateral agreements and destination country laws suggests that an appropriate model of the international

migration, for a particular overseas labor market, could be that set out in Figure 1. There is a binding minimum wage, W_m, and the willing supply of Filipino workers at this wage greatly exceeds market demand. Market demand is given by the market demand curve, LD(GDP1, X), where demand depends on the level of GDP in the destination country economy, and on characteristics, X, of the occupation and destination country. The result is then that the number of individuals who get to migrate, M1, is purely determined by labor demand. Variation in wages across destinations then arises from variation in these minimum wages.

Consider then the impact of a positive shock to GDP in the destination country, which increases GDP from GDP1 to GDP2. If the minimum wage still continues to bind, all adjustment will be through migration quantities – the number of migrants will increase to M2, while wages will remain at the minimum wage, W_m. This leads to the following hypothesis:

Hypothesis 1: If binding minimum wages are the main distortion, international migration flows will be positively correlated with changes in GDP in destination countries, while wages will not be.

This analysis assumes that the minimum wage itself does not change with the business cycle. This seems a plausible assumption in the case where wage contracts are negotiated for several years or where the Philippines itself has set the minimum wage. However, if minimum wages (or the minimum allowed in work contracts) are determined with reference to prevailing market wages, the minimum wage may increase at the same time as labor demand, thereby increasing wages and reducing the extent to which the increase in labor demand increases employment. This seems more likely in skilled occupations, suggesting we may see heterogeneity in the response to GDP shocks by skill.

Dube et al. (2007) note that this prediction that a rise in minimum wages will reduce employment need not hold in the standard competitive labor model if

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product demand is not price elastic and input substitution possibilities are not present. Adjustment then occurs through goods prices. In our setting it seems likely that on average products being produced by migrants have some price elasticity, and, furthermore, that employers have some scope for substituting Filipino workers for other inputs (including workers from other migrant nations, a topic we return to in Section 5), so that higher minimum wages would lower migrant employment.

However, a rise in minimum wages need not reduce employment under some non-competitive labor market models. For example, under dynamic monopsony models, labor market frictions from matching and hiring workers result in an equilibrium with positive unemployment and positive quit rates (Manning, 2004). A rise in the minimum wage can then result in reductions in quitting and/or vacancy rates, which can potentially increase net employment while reducing the flow into and out of employment. The standard contract length terms of Filipino workers may make this model less relevant in our setting, but to check this we will examine how contract duration and rehires of migrants change.

Binding Migration Quotas

An alternative form of distortions could arise from binding migration quotas. A binding quota restricts labor demand to a maximum of the quota amount M_Q, leading to a wage W1 above the market clearing level (Figure 2). Countries with more binding quotas will then pay higher wages. In such a model, the prediction is an increase in output in the destination country will cause firms to compete harder for the same number of quota spaces, leading to an increase in wages, and no adjustment in the quantity of migrants.

Of course the quota itself might be endogenous to economic conditions at destination, with quotas increasing during economic expansions and being reduced in recessions. This would lead to some procyclicality in both quantities

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and wages, since it seems unlikely that quotas would be adjusted frequently and finely enough to keep wages fixed.

Whilst plausible in some contexts, we believe it unlikely that binding quotas is the main distortion in the global market for Filipino migrant labor given the evidence discussed above which shows that the majority of countries do not have quotas, and those that do typically only have them for some categories of migrants. Nevertheless, it remains an empirical question as to whether wages or quantities see the majority of the adjustment to GDP shocks, shedding light on which distortion is more likely to be underlying the high wage gains to be had through migration. Since the above theory suggests responses are likely to vary with migration policy, we will also examine heterogeneity in responses to whether or not destination countries use some form of a migration quota.

Matching models

In matching models of the labor market (e.g., the canonical Mortensen and Pissarides 1994 model), equilibrium unemployment can occur without minimum wage laws or quotas. It is common for theoretical macroeconomic models to assume some form of wage rigidity (e.g., Hall 2005, Shimer 2005), so as to replicate the empirical variability in unemployment. But the empirical evidence (in particular Solon, Barsky and Parker 1994 and Martins, Solon, and Thomas 2012) actually reveals substantial wage responses to macro fluctuations,[7] and in particular this is true for hiring (starting) wages. Taking the observed business-cycle procyclicality of hiring wages as a departure point, the model of Pissarides (2009) matches the empirical variability in unemployment by modifying the specification of matching costs, while allowing flexibility in hiring wages. Such a model predicts, in accord with the empirical facts, procyclicality in both new hires and hiring wages. This prediction will be directly tested in our empirical analysis,

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[7] See also Bils (1985), Shin (1994), Devereux and Hart (2006), Martins (2007), and Carneiro, Guimaraes, and Portugal (forthcoming).

which will examine new hires and hiring wages in the international migrant labor market.

3. Data

3.1 POEA Micro Data

The data are from the Philippine Overseas Employment Administration's (POEA) database of departing OFWs. Created in 1982, POEA is a Philippine government agency within the Department of Labor and Employment. POEA has a multifaceted agenda: it monitors recruitment agencies, monitors worker protection, and conducts a variety of other tasks relating to the oversight of the overseas worker program. Further, as a final step prior to departure, all OFWs are required to receive POEA clearance. Since all OFWs are required to pass through POEA, the agency has a rich dataset composed of all migrant departures from the Philippines. This is the first paper to utilize this rich data resource.

Since all OFWs must pass through POEA, the dataset contains data on departures for all land-based new hires leaving the Philippines between 1992 and 2009 for temporary contract work. New hires are defined as OFWs who are starting a contract with a new employer. These migrants may have previously worked overseas, but the contract that they are presently departing on is new, rather than renewed. For each OFW departure from the Philippines, the database includes name, birthdate, gender, civil status, destination, employer, recruitment agency, contract duration, occupation, date deployed, and salary. Typical contracts are of one or two year durations, with an average duration of 17.7 months over our sample period. Female workers account for 60.6 percent of new hires during this period. The most common occupations are in production (e.g., laborers, plumbers), services (domestic helpers, cooks) and professional occupations (nurses, engineers, entertainers).

To study the flows of migrants in response to fluctuations in GDP, individual migration records are grouped by year and destination country and combined to

create a count of the number of migrants to each destination country annually between 1992 and 2009. Table 1 displays the top twenty OFW destinations averaged over the sample period, along with their average annual flow. Saudi Arabia is the most common destination, accounting for 33% of new hires. It also shows the average monthly wage in US dollars by destination, showing wide differences in the wages Filipinos earn in different locations. Since the micro data contain a few outliers on wages, we trim at the 1st and 99th percentiles before taking means.

Since the micro data from POEA does not include skill levels, we calculate average education levels by occupation using the 1992-2003 Survey of Overseas Filipinos (SOF),[8] and assign each occupation the average education level. We use this to then construct skill quartiles of aggregated occupational cells in our data. The average years of education for occupations in the first quartile is 11.6 years, 12.8 years for the second quartile, 13.8 years for the third quartile, and 15.1 years of education for the fourth quartile. One sees notable differences in the wages that a worker of a given skill level can earn across destination countries. For instance, OFWs in the first skill quartile in Saudi Arabia receive an average wage of $336 per month, whereas OFWs of the same skill level in Japan earn an average monthly wage of $1,505. This large variation across destination countries holds for the more skilled quartiles as well. The highest skilled workers in Saudi Arabia earn $553 per month, whereas in Japan these OFWs earn $1,661 on average each month.

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[8] The Philippine Labor Force Survey is administered annually to a nationally-representative sample of households. The SOF is administered as a rider to the LFS if the household reports having any members working overseas, and contains information on migrant demographics, overseas occupation and location, and remittances (all reported by the household remaining behind in the Philippines).

3.2 Macro Data

Data on annual real GDP (constant 2000 US$) over the sample period were obtained from the World Development Indicators database and the CIA World Factbook. These data are then matched to the POEA data based on destination country and year of departure. Over the sample period, destination countries in our sample experience vastly different rates of GDP growth as well as varied fluctuations in growth. For instance, during the Asian Financial Crisis, Asian countries such as Japan or South Korea faced dramatic reductions in GDP growth, whereas Middle Eastern destinations such as Bahrain or Kuwait maintained fairly stable growth. Online appendix Figure 1 plots real GDP growth in the top 10 destinations for OFWs. In addition to the differences in growth rates in 1997 during the Asian Financial Crisis, another period of high volatility was during the Global Financial Crisis, which by 2009 had affected some destinations more than others.

3.3 Sample Restrictions

The sample is restricted to include only countries with a positive number of OFWs in every year and to countries with GDP data available in each year, in order to create a balanced panel. These sample restrictions result in 54 destinations included in the analysis. Online appendix Table 1 presents a list of all included destination countries.

4. Results

4.1 Aggregate Impacts

In order to measure the impact of fluctuations in GDP at destination on the flows of Filipino migrants and the wages paid, we estimate the following equation for destinations $j=1,2,...,54$ and time periods $t=1992,...,2009$:

$$log\ (M_{jt}) = \beta_0 + \beta_1 * log(GDP_{jt}) + \alpha_j + \gamma_t + \varepsilon_{jt} \qquad (1)$$

where M_{jt} is the number of Filipino migrants leaving on new contracts to country j in year t; GDP_{jt} is the level of real GDP in country j in year t; α_j are

destination country fixed effects; γ_t are time period fixed effects; and ε_{jt} is the error term for country j in year t. Standard errors are clustered at the level of the destination country. M_{jt} is replaced with mean or median wages in order to test the response of wages earned by these migrants to GDP. We estimate equation (1) for all migrants, and then separately by gender.

Time fixed effects control for any aggregate changes occurring in the world economy, as well as for any Philippines-specific changes that are affecting the overall supply of migrants.[9] Country fixed effects remove time-invariant effects in destination countries, such as their overall policies towards migrant labor. The resulting identifying variation then comes from differences across destination countries in how GDP fluctuates over time. Since Filipino labor supply is small relative to the total labor forces of destination countries and we are looking at new contract labor movements, it seems reasonable to assume there is no reverse causation whereby changes in Filipino migrant numbers are driving GDP changes at destination. Appendix Figures 2 and 3 provide scatterplots of the underlying data.

We use these data to estimate equation (1), which differs from the scatterplots in also including year fixed effects in the regression. The results are shown in panel A of Table 2. Column 1 shows the impact of GDP in a destination country on the total quantity of migrants going to that destination. For Filipino migrants as a whole this coefficient is 1.5 and significant at the 1 percent level. This elasticity suggests that if destination country has 1 percent higher growth in output than other destination countries, 1.5 percent more Filipinos migrate on new contracts to this destination than migrate to other destinations. We can also not reject unit elasticity, whereby migrant numbers increase proportionately with GDP. Columns 2 and 3 then examine this elasticity separately by gender. The point estimates

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[9] Note this also controls for any overall devaluation or appreciation in the Philippines exchange rate as well.

suggest slightly higher elasticity of migrant flows for females than males, but we cannot reject equality of the two.

By way of comparison, Kapsos (2005) estimates the aggregate national employment elasticities of growth in different regions around the world. He finds globally employment has an elasticity of between 0.3 and 0.4 with GDP, but is higher in services (0.6), and in the Middle East (1.1), with the elasticity for women in the Middle East being 2.2. Since migrant labor is likely to be easier for firms to adjust than native labor, it seems reasonable that our estimates are more on average higher than those of natives, and more similar to the Middle East estimates (where much of the labor force is foreign workers).

In contrast, columns 4 through 9 of Table 2 show no significant response of migrant wages at destination to changes in GDP at destination. The coefficients are all close to zero, and in five out of six cases, slightly negative.

Taken together, our results suggest all adjustment to GDP shocks occurs through quantities and not wages, which is consistent with hypothesis 1 and the binding minimum wages model. This pattern is not consistent with the aggregate volatility of employment and hiring wages in developed countries, because both employment and hiring wages are procyclical to a similar degree. Therefore matching models of the macroeconomy that incorporate such procyclicality (e.g., Pissarides 2009) cannot account for the patterns in our data.

The results above show a strong elasticity of migrant numbers to GDP, with no responsiveness of migrant wages. In panel B of Table 2, we check whether our results are being driven by the occupational mix of workers changing with the business cycle at destination. To do this, we control for the share of Filipino migrants that are in each of the 10 most common occupations plus the residual share for each country-year. We see that the point estimates and their significance are very similar to the results in panel A, so that we still obtain the same results even holding occupation fixed.

We consider several additional checks on the robustness of these results, which are reported in detail in the online appendix. In particular, we show that quantity elasticities look similar if we use total hires or rehires instead of just new contracts; that contract length does not vary with GDP at destination; that the results are robust to using up to 5 lags of log GDP; that impacts are not different in recessions; and that the results are robust to a number of alternative criteria for which countries we include in the regressions. In addition, we show in US Census data that Filipino workers in the US typically earn at least as much as native-born workers in the top Filipino migrant occupations, consistent with our claim that migrants face binding minimum wages in destination labor markets.

4.2 Heterogeneity of Impacts by Skill Level

Legally specified minimum wages in destination countries provide a reason why the market for legal low-skilled migrant labor does not clear, and for the large wage gains for low-skilled migrants documented in Clemens et al. (2009). However, the absolute income gains from emigration are even larger for high-skilled workers, with Gibson and McKenzie (2012) showing that very high-skilled workers from four developing countries increased their annual incomes by US$40,000-75,000 by emigrating. Together with the institutional practices of restricting high-skilled immigrants to earn the prevailing wage, this suggests that the labor market for high-skilled workers also faces binding minimum wages, and that we may therefore also see most of the adjustment to output shocks at destination occurring via quantities rather than wages even for high-skilled workers.

We investigate this in Table 3, which estimates equation (1) separately by skill quartile. The lowest skill quartile includes occupations like construction work, farming, and welding; the second includes occupations like domestic helpers (maids), shop assistants, and cooks; the third occupations like supervisors, caregivers, and electricians; and the highest skill quartile includes occupations

like engineers, teachers and accountants. Panel A shows that the quantity of all four skill groups has a positive relationship with GDP, with no monotonic relationship in the point estimates across skill levels, and we cannot reject equality of impacts across the four skill groups. Low, medium, and high skilled workers therefore all seem to experience a reduction in migrant numbers when GDP falls and increase when it rises.

Panels B and C of Table 3 examine the responsiveness of median and mean wages respectively to GDP by skill quartile. Again we cannot reject equality of coefficients across the four skill categories at conventional skill levels and find point estimates which are mostly small in magnitude and statistically insignificant. An exception is the second quartile, in which we see a significant negative coefficient on median wages of -0.31, and a similar-sized, but statistically insignificant coefficient on mean wages. This suggests wages for individuals in this skill range may actually fall when economic conditions at destination improve, although if we control for multiple hypothesis testing by multiplying the p-values by the number of separate outcome-group results being tested here for wages, then this result also would not be significant.

4.3 Does who migrates change over the business cycle?

An alternative explanation for our results could be that the selection of who migrates is changing over the business cycle. In particular, in a market-clearing model with wages falling in a recession, we could observe in our data a reduction in the quantity of individuals migrating with no change in mean wage paid to migrants if low-skilled, lesser-paid, individuals experience more of a reduction in migrant numbers than higher skilled individuals do during recessions. Indeed Solon et al. (1994) show that such a change in composition leads aggregate wages in the U.S. to be less procyclical than indicated by longitudinal microdata.

We have shown above that our results are robust to controlling for occupational categories, and that we cannot reject that the elasticity of migrant

quantities to GDP changes at destination is constant across skill quantiles. Nevertheless, as a further check, we use the Survey of Overseas Filipinos to directly examine whether the observable characteristics of who is migrating varies over the destination business cycle.

The Survey of Overseas Filipinos is an annual survey which asks a nationally-representative sample of households in the Philippines about members of the household who left for overseas in the past five years (see Yang, 2008). Since it is remaining members of the household who are reporting on the absent migrants, only basic details of the characteristics of these migrants are available. However, it is the most comprehensive source available on the characteristics of new Filipino migrants, and importantly, does contain information on the destination country and whether this is the first time an individual is migrating or not for contract work. We use data from the 1992-2003 surveys.

In Table 4 we use this data to test whether the age, sex, marital status, place of origin in the Philippines, and education of new migrants going to a particular destination varies with GDP shocks at destination. To do this, we estimate equation (1) with these characteristics as the dependent variables. We find no statistically significant relationships between GDP changes at destination and the characteristics of the migrants going to that destination. The dependent variables are in levels, and GDP is in logs, so to interpret the magnitude of the coefficients, we divide them by 100 to get the impact of 1 percent change in GDP at destination. Thus not only are the coefficients not statistically significant, but we also see they are very small in magnitude. For example, 1 percent higher GDP at destination is associated with a decrease of 0.049 years in the mean age of migrants going to that destination and an increase of 0.024 years in the mean education of migrants going to that destination.

Thus we find no evidence of large selectivity in which individuals migrate over the business cycle, at least in terms of these observable characteristics. We

speculate that this composition effect is much less important for the type of migrant labor examined here than it is for examining the procyclicality to domestic business cycles of native wages because of the much greater distortions in global labor markets.

5. Analysis of a Change in the Minimum Wage for Domestic Helpers

The results presented thus far are consistent with the case of binding minimum wages presented in section 2.5 above. To bolster this interpretation of the results, we provide direct evidence (via a natural experiment) that minimum wages bind for an important subset of overseas jobs, domestic helpers (maids). In addition, this analysis will also rule out the possibility that true wages paid to OFWs are in fact changing in response to GDP shocks, but overseas employers are simply misreporting (failing to report changes in wages).

On December 16, 2006, the Philippine government implemented the Household Service Workers Reform, aimed at improving working conditions for Filipino migrants working as domestic helpers (maids).[10] New policies associated with the reform included worker skill assessments, country-specific language and culture training, and the elimination of placement fees. One of the main components of the policy change was an increase in the minimum wage to $400 per month for domestic helpers. This doubled the prevailing wage rate of $200, especially in Middle Eastern countries. All employers hiring domestic helpers with visas issued after December 16, 2006 were required to pay a minimum wage of $400 per month.[11]

Ezquerra (2009) describes the political economy of this reform, noting that it was sparked by the Israeli-Lebanon war of 2006, in which the Philippines

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[10] In the context of overseas Filipino work, individuals employed by a private household overseas for childcare and/or general household work are typically referred to as "domestic workers," "maids," "domestic helpers," or "household service workers."

[11] See http://www.poea.gov.ph/hsw/hsw_advisory1.html for details about all new regulations [accessed July 19, 2011].

government acted to repatriate quickly its migrant workers, including a large number of domestic workers. This brought attention to the exploitative conditions that some of these workers experienced, with media accounts of a worker saying the war gave her the chance to escape a master who repeatedly raped her; a worker dying when trying to escape from her employer who wouldn't let her leave by tying together bedsheets and attempting to escape from a fourth floor balcony; and other returnees telling how they were made to sleep in little rooms with dogs, eat leftovers, and work until midnight.

However, the increase in minimum wages proposed under the reform also met strong resistance from recruitment agencies, arguing that this would have strong negative impacts on migrant numbers. Ezquerra (2009, p.148) describes how "Recruiting agencies and aspiring domestic workers held rallies in Metro Manila, in which the latter protested the upcoming reforms and expressed their willingness to work for less than $400". In response to this pressure the government dropped a plan to raise the minimum age for recruitment as a domestic employee to 25, and delayed the implementation of the reform until March 2007, but the reform was still implemented.

For a number of countries, this policy change thus led to an exogenous and large increase in wages for domestic helpers. Many destinations, such as Canada and Italy, already paid domestic helpers wages above $400 per month, and the reform had no effect on the wages paid in these locations. Similarly, even in countries facing a binding minimum wage for domestic helpers due to the policy change, this wage increase did not have a binding effect on the minimum wage paid to Filipino workers in other industries. Thus, using either countries or industries not subject to the minimum wage change as a control group, we can conduct a difference-in-difference analysis to test the effect of the increase in the minimum wage on the quantity of OFWs and on OFW wages.

5.1 Estimation Strategy

The treatment group in this analysis is composed of domestic helpers in 18 destination countries that faced a new binding minimum wage after the policy change.[12] We create two comparison groups for the difference-in-difference analysis. First, we use domestic helpers in countries where the median wage prior to 2007 was greater than $400 (i.e., countries not affected by the policy change). 21 countries are included in this comparison group.[13] Alternatively, we restrict the sample to include only the 18 destinations in which domestic helpers faced a higher minimum wage as a result of the policy change. We then create a comparison group of the other occupations in these countries.[14] Our difference-in-difference analysis compares the treatment and control groups before and after the policy change in 2007.

When other countries not facing a binding minimum wage change are the comparison group, we measure the effect of the minimum wage change by estimating the following equation for destinations $j=1,2,...,39$ and time periods $t=2001,...,2009$:

$$M_{j,t} = \beta_0 + \beta_1 * BindingMinimumWageChange_{j,t} + \alpha_j + \gamma_t + \varepsilon_{jt} \qquad (2)$$

where $M_{j,t}$ is the number of Filipino domestic helper migrants leaving on new contracts to country j in year t; $BindingMinimumWageChange_{j,t}$ is an indicator equal to 1 if the country j is one of the 18 countries facing a binding change in the minimum wage for domestic helpers, and t is 2007, 2008, or 2009 (after the introduction of the wage increase). α_j are destination country fixed effects; γ_t are

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[12] Countries included in the treatment group are Bahrain, Brunei Darussalam, China, Cuba, Cyprus, India, Jordan, Kuwait, Malaysia, Oman, Pakistan, Palau, Saudi Arabia, Singapore, South Africa, Syrian Arab Republic, United Arab Emirates, and Republic of Yemen.

[13] Countries included in this comparison group are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Hong Kong, Israel, Italy, Japan, South Korea, New Zealand, Russia, Spain, Sweden, Switzerland, Taiwan, United Kingdom, and United States. Of the 22,380 domestic helpers in the comparison group in 2006, only 7 workers have wages less than $400.

[14] There are 17 main occupations that encompass 88.7% of OFWs. We compare domestic helpers to these OFWs in the other 16 occupation groups.

year fixed effects; and ε_{jt} is the error term for country j in year t. Standard errors are clustered at the destination country level. The sample is restricted to the period 2001 to 2009.

When the comparison group is other occupations in these same low-wage countries, we estimate the following equation for destination *j=1,2,...,18,* occupation *s=1,2,..,17* and time periods *t=2001,...,2009,* :

$$M_{s,j,t} = \gamma_0 + \gamma_1 DomesticHelper_s + \gamma_2 BindingMinimumWageChange_{s,j,t} +$$
$$\alpha_j + \delta_t + \varepsilon_{s,j,t} \qquad\qquad (3)$$

Where *BindingMinimumWageChange$_{s,j,t}$* takes value 1 for the domestic helper occupation after the domestic helper wage increase (years 2007-2009) and zero otherwise. *DomesticHelper$_s$* is a binary variable equal to 1 for domestic helpers and 0 for all other occupations. α_j are destination country fixed effects; γ_t are year fixed effects; and ε_{jt} is the error term for country j in year t. Standard errors are clustered at the destination country level.

5.2 Results

Prior to estimating equations (2) and (3), we first confirm that our previous empirical results from estimation of equation (1) for all jobs in aggregate also holds for domestic helpers. Re-estimating equation (1) for only domestic helper jobs, we find that the coefficient on log GDP in the regression for log counts, 1.138, is very similar to the corresponding coefficient in Table 2 and statistically significant at the 10 percent level. By contrast, the coefficient on log GDP in the wage regression is small in magnitude (-0.079) and not statistically significantly different from zero at conventional significance levels. This also corresponds to the wage result in Table 2 for all jobs in aggregate.

We then turn to estimation of equations (2) and (3); results are in Table 5. Column 1 shows the results for the full sample, including destination and year

fixed effects. The coefficient on the indicator for a binding increase in the minimum wage is the causal impact of the minimum wage change on the quantity of migrants. When the comparison group is countries with a non-binding minimum wage for domestic helpers (Panel A), the impact of the minimum wage change is a reduction in employment of Filipino domestic helpers by 54.6% (exp(-0.605)). When the comparison group is occupations other than domestic helpers (Panel B), the impact is a 56.8% (exp(-0.565)) reduction in employment of Filipino domestic helpers compared to other unaffected occupations.

Column 2 shows that this reduction in employment was accompanied by an increase in wages, both relative to the wages of domestic workers in countries which weren't affected by the new law, and relative to the wages of Filipino migrant workers in other occupations in the same destination country who were not affected by the new law. The increase in wages is estimated to be between 27 and 46 percent, depending on which comparison group is used.

To test the robustness of our results, in the last two columns we restrict the sample to only destination countries that hire domestic helpers in every year of the sample period (2001-2009). These results are similar to the full sample results: an increase in the minimum wage led to a decrease in the quantity of domestic helpers in countries where the minimum wage was binding and an increase in the wage paid to these workers.

If employers and workers were able to evade these regulations by reporting different wages on their official contracts to those paid in practice, then we would expect to see only a change in the stated wage, with no reduction in employment. The fact that we find a reduction in employment therefore provides clear support that the minimum wage binds in practice as well as in theory, and that setting high minimum wages increases the wages migrants earn at a cost of a reduction in the number of jobs available to them.

5.3 Substitutability of Filipino workers with other nationalities

The large quantity response to a change in minimum wages here is in contrast to many studies in the labor literature which have found zero or relatively limited employment responses to changes in the minimum wages (e.g. Card and Krueger, 2000; Neumark and Wascher, 2000; Dube et al, 2010). There are two possible reasons for this difference. First, the change we are examining is a much larger change, doubling the wage; by contrast, other studies have examined more marginal changes in minimum wages. If there are some fixed costs to firing workers, we might expect quantity responses to be more than proportionately larger for large changes in minimum wages. Secondly, and likely more important, ours is a context in which only some workers (Filipinos) are subject to the minimum wage change.

If Filipino workers were perfect substitutes for either native workers of the destination country, or for immigrant workers from other countries, then we would expect to see no Filipinos hired at all if minimum wage requirements imposed by the government of the Philippines were binding. However, there are reasons to think that Filipino workers are not perfect substitutes for either natives or migrants from other countries, so that the Philippine government is effectively engaging in monopolistic competition, and can charge a higher wage for its workers without losing all demand for these workers.

Policies that require employers of migrants to show that there is a lack of qualified local applicants at the prevailing wage are one reason that migrant workers are not perfect substitutes for local workers in the types of jobs for which migrant workers get hired. Indeed imperfect substitution between native workers and immigrants has been found in several recent empirical studies, and has been used to help explain the relatively limited impacts of immigration on the wages of native workers (Ottaviano and Peri, 2012; Manacorda et al, 2012). As such, we

should not expect Filipino workers to be completely replaced by native workers if the Philippine government increases the wages its migrants must be paid.

It seems more likely that Filipino workers will be substitutable with immigrant workers from other countries than with native workers. We are unaware of any data comparable to the Philippine data we have which would enable us to look at how migrant numbers from competitor countries like Indonesia or Bangladesh reacted to the change made in Philippine policy. However, it does appear that the drop in Filipino numbers was at least in part made up by recruitment from other countries, with newspaper reports from countries like Qatar and the U.A.E. discussing recruitment efforts to bring in workers from non-traditional source countries like Bosnia, Morocco, and Sudan.[15]

Nonetheless, statements by recruiters and foreign government officials suggest that Filipino workers are seen to have certain desirable attributes which make them less than perfect substitutes with immigrant workers from other countries. First, Filipinos have English language proficiency, so that, for example, Hong Kong employers of housemaids are said to prefer Filipino workers over Malaysian and Indonesian workers (GMA news, 2011). Second, worker training in the Philippines is often done with an overseas market in mind, so Filipino workers' skills are often more easily adapted to overseas markets (Visa Workforce, undated). Third, Filipino workers are often touted as having better work ethics, being more sociable, and being better able to adapt to working abroad than nationals of many other countries (Karim, 2008). As a result, we might not expect all Filipino workers to be replaced by workers from other countries when their relative wages rise, but still expect the quantity response to be larger than would be the case when the minimum wage change applied to all workers.

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[15] E.g. http://dohanews.co/post/15124268586/qatar-to-cast-wider-net-for-domestic-workers [accessed February 5, 2013].

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6. Conclusions

The view that very large distortions exist in the global market for migrant labor is widespread among economists (Clemens, Montenegro and Pritchett, 2011 and Rodrik, 2011). However, empirical work that identifies the specific nature of the distortions is scarce, in part due to severe data limitations. This paper's main contribution is to shed light on key distortions in the international market for migrant labor via analysis of migrant flows and contracted wages in a unique data resource: the Philippine government's database of contracted migrant worker jobs.

We estimate the impact of economic shocks in Filipino migrant destination countries on migrant flows to and the wages that migrants are paid in those destinations, from 1992-2009. We find that percent changes in destination country GDP have a large (roughly one-to-one) impact on percent changes in Filipino migrant flows, but, by contrast, essentially zero impact on migrant wages. This pattern is consistent with the existence of a particular type of distortion in the market for international migrant labor: binding minimum wages. This pattern would not be predicted by market-clearing models of the labor market or binding immigration quotas.[16]

These minimum wages appear to be occupation-specific; we cannot reject that the effect of GDP fluctuations is similar across higher- and lower-skilled migrant occupational categories. We also provide direct evidence of the existence and impact of binding minimum wages for an important occupational category (domestic helpers), via analysis of a natural experiment that raised the mandated minimum wage for Filipino domestic helpers. This minimum wage increase led to increases in wages and reductions in migrant flows in this occupational category.

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[16] The pattern is also contrary to the empirical procyclicality of both employment and hiring wages observed in a variety of developed economies (the destinations for many migrant workers), indicating that models of the macroeconomy that properly incorporate such procyclicality also cannot explain our results.

Direct evidence on the nature of distortions in the market for international migrant labor is important, because it clarifies the nature and interconnectedness of the welfare gains and losses associated with international migration. Wage floors for international migrant work mean that the wage gains for migrants that are able to secure work overseas are magnified. But at the same time, the total quantity of migrant labor is smaller than the market-clearing level. Furthermore, these same wage floors also lead migrant flows to be more sensitive to economic shocks in destination countries than they would be if markets cleared, since they lead all labor market adjustment to occur via quantities rather than wages.

Second, our evidence reveals important welfare consequences of policies instituted by destination countries as well as by the migrant-source countries that set wage floors for international migrant work. On the destination country side, the policies in question include the U.S. federally-mandated minimum wage as well as H1-B rules requiring immigrant workers be paid the prevailing wage for the worker's occupation. On the migrant-source country side, the key policy relevant for our analysis is the Philippine government's regulation of labor contracts to ensure wages paid are above occupation-specific minimums. Our results reveal that these policies lead to higher wages for workers able to secure jobs, but reduce the number of jobs available and lead the burden of adjustment to destination-country economic shocks to fall entirely on the employment rather than the wage margin. Migrant-source countries such as the Philippines are for the most part powerless to change regulations setting minimum wages for migrants in destination countries, but they clearly can change their own regulatory practices related to migrant labor. Our results underline the negative economic consequences of source-country government efforts to impose wage floors for migrant workers.[17]

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[17] That said, another rationale given for imposition of wage floors for occupational categories such as domestic helpers is that they lead lower-quality employers to exit the market, resulting in less

Our results are most directly relevant for international migrant labor from a particular source country, the Philippines. That said, the Philippines is one of the most important global sources of workers for the international contract labor market, and several other countries such as India, Bangladesh, and Sri Lanka are seeking to emulate Philippine government policies regulating and promoting international migrant work (Ray et al., 2007). Our results documenting the negative economic consequences of minimum-wage regulations on the part of migrant source countries should be an important input in these countries' policy-setting process.

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Figure 1: Response of Demand for Filipino Workers to GDP Shock with Binding Minimum Wages

Wage

W_m

W^*

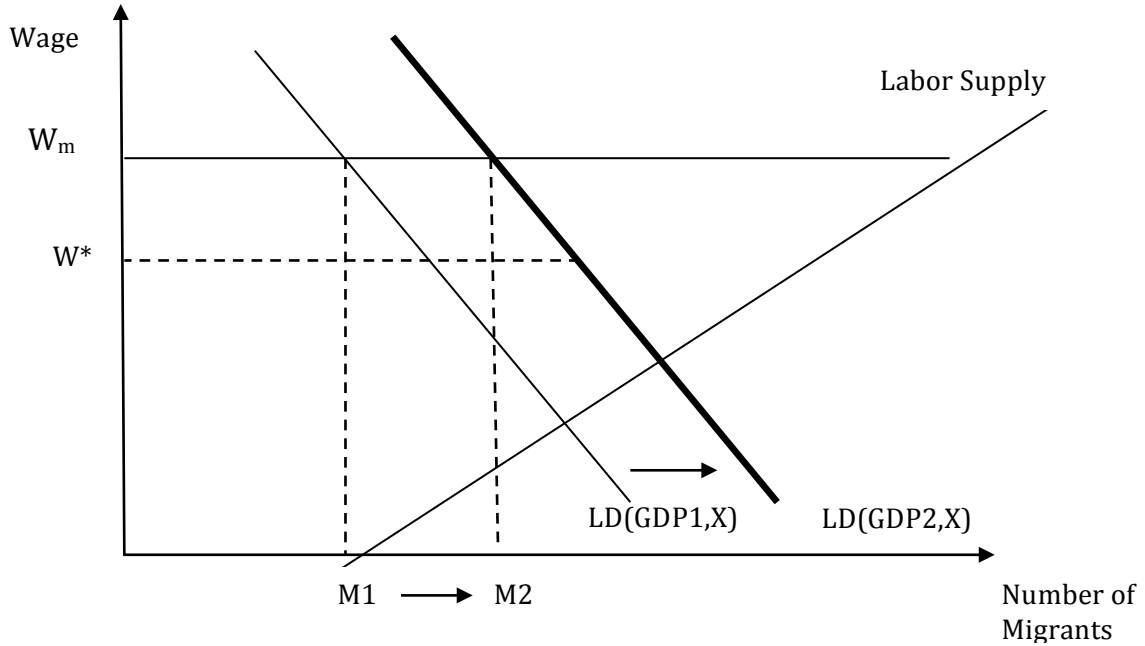Labor Supply

LD(GDP1,X)   LD(GDP2,X)

M1 ⟶ M2

Number of Migrants

Figure 2: Response of Demand for Filipino Workers to GDP Shock with Binding Quotas

Wage

W2

W1

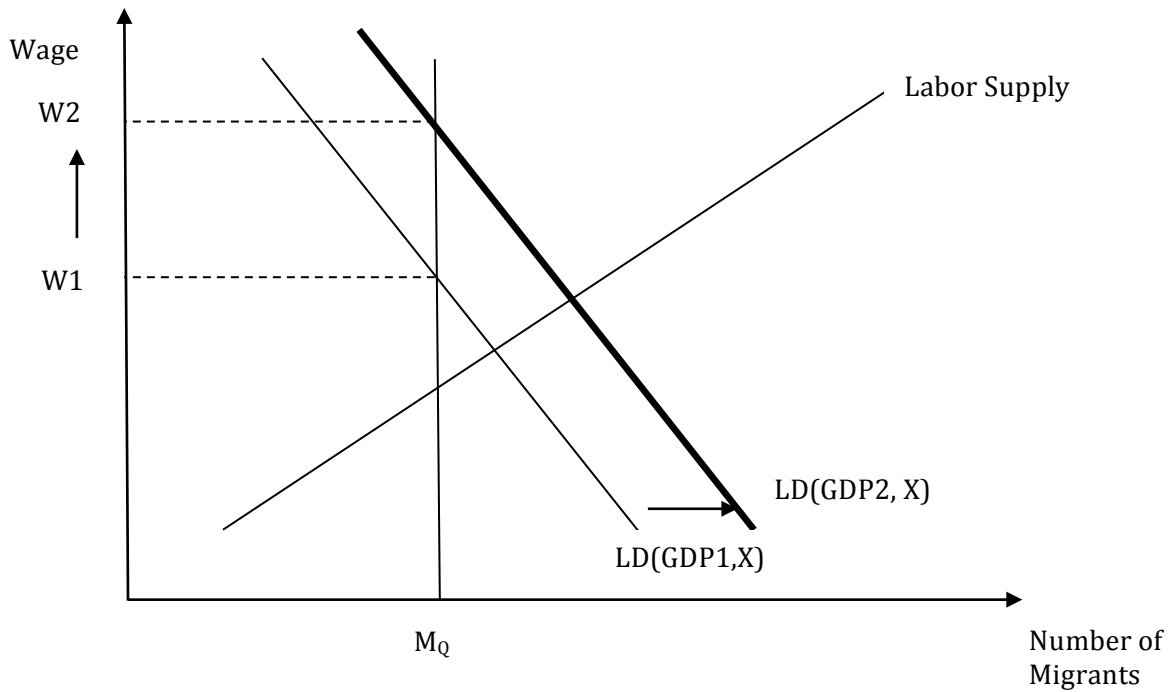Labor Supply

LD(GDP2, X)

LD(GDP1,X)

M_Q

Number of Migrants

Table 1: Top 20 Migrant Destinations

Destination	Percent of total contracts (1992-2009)	New contracts per year		Monthly wages ($)			
		Mean	Standard deviation	Mean	Standard deviation of mean	Median	Standard deviation of median
1. Saudi Arabia	33.10%	78860	25832.76	372.74	29.60	341.49	29.90
2. Japan	16.04%	38205	24348.10	1779.99	164.16	1789.53	172.00
3. Taiwan	14.53%	34621	14218.45	499.77	26.98	496.51	28.67
4. United Arab Emirates	10.12%	24121	16313.17	347.70	66.22	279.06	61.52
5. Hong Kong	8.92%	21247	4392.89	470.68	43.25	453.56	29.63
6. Kuwait	4.97%	11848	8248.60	349.66	88.05	292.80	85.58
7. Singapore	1.44%	3438	698.81	535.80	182.84	354.14	179.84
8. South Korea	1.44%	3435	2699.86	514.18	202.45	483.67	215.76
9.Malaysia	1.38%	3298	3086.11	386.53	152.79	273.58	123.48
10. Bahrain	1.34%	3190	1529.07	377.31	67.25	306.01	54.71
11. Brunei Darussalam	0.01%	3069	1250.75	372.28	63.18	308.53	56.86
12. Canada	1.05%	2496	2770.76	1016.12	305.69	985.59	284.59
13. United States	1.00%	2387	1252.49	1755.94	329.68	1754.60	490.34
14. Israel	0.67%	1593	1299.48	687.82	180.12	684.28	194.81
15. Oman	0.65%	1544	993.39	353.57	92.61	243.73	76.46
16. United Kingdom	0.60%	1432	1706.25	1474.97	536.70	1446.43	612.99
17. Italy	0.49%	1171	1305.01	681.70	131.32	611.35	108.79
18. Cyprus	0.35%	844	543.51	353.68	76.86	317.11	55.92
19. Spain	0.31%	729	599.73	683.56	224.11	656.01	213.78
20. Jordan	0.30%	705	1184.48	312.97	95.00	277.78	94.28

NOTES: Qatar is omitted from the analysis due to lack of available GDP data.

Wages are trimmed at the 1st and 99th percentiles.

Table 2: Responsiveness of the Quantity and Wages of New Migrants to GDP

	Log Quantity of New Migrant Contracts			Log Median Wages Paid to Migrants			Log Mean Wages Paid to Migrants		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
Panel : Base Specification									
Log GDP	1.522***	1.148**	1.983***	-0.063	-0.019	-0.045	-0.041	-0.027	0.043
	(0.501)	(0.527)	(0.621)	(0.158)	(0.147)	(0.226)	(0.137)	(0.116)	(0.209)
Number of Observations	972	972	972	967	930	901	967	930	901
R^2	0.863	0.835	0.903	0.738	0.678	0.756	0.762	0.699	0.767
Mean of the Dependent Variable (Levels)	4482	1668	2814	737	816	706	794	871	738
P-value of Equality of Gender Coefficients		0.2995			0.6390			0.8767	
Panel B: Holding Occupation Shares Constant									
Log GDP	1.340***	1.276***	2.067***	-0.142	-0.096	-0.227	-0.113	-0.097	-0.135
	(0.375)	(0.438)	(0.666)	(0.148)	(0.146)	(0.201)	(0.124)	(0.112)	(0.174)
Number of Observations	972	972	972	967	930	901	967	930	901
R^2	0.914	0.861	0.912	0.813	0.751	0.819	0.842	0.780	0.838

NOTES: The sample includes all new hires from 1992-2009.

All regressions include country and year fixed effects. Robust standard errors clustered at the country level are in parentheses.

The unit of observation is the country-year, and all wages are trimmed at the 1st and 99th percentiles to remove outliers.

Panel B regressions control for the share of OFWs in the top 10 occupations for a country-year, plus the residual share for all other occupations.

Countries are included if they have new hires and non-missing GDP data in each year from 1992-2009.

*** indicates significance at the 1% level. ** indicates significance at the 5% level * indicates significance at the 10% level.

Table 3: Responsiveness of Quantities and Wages to GDP by Skill Quartile

	Lowest Quartile	Second Quartile	Third Quartile	Highest Quartile	p-value for test of equality
Panel A - Dependent Variable: Log Quantity of New Contracts in this Skill Level					
Log GDP	0.668	1.295**	0.652	1.046***	0.7890
	(0.821)	(0.496)	(0.494)	(0.299)	
Number of country-year observations	717	904	832	861	
Panel B - Dependent Variable: Log Median Wages paid to Workers in this Skill Level					
Log GDP	-0.194	-0.309**	0.020	0.101	0.6390
	(0.123)	(0.153)	(0.161)	(0.175)	
Number of country-year observations	708	893	817	823	
Panel C - Dependent Variable: Log Mean Wages paid to Workers in this Skill Level					
Log GDP	-0.131	-0.257	0.060	0.151	0.8767
	(0.111)	(0.154)	(0.133)	(0.151)	
Number of country-year observations	708	893	817	823	
% of Individual Level Observations	13.29	52.60	22.58	11.53	

NOTES: The sample includes all new hires from 1992-2009.

All regressions include country and year fixed effects. Robust standard errors clustered at the country level are in parentheses.

The unit of observation is the country-year, and all wages are trimmed at the 1st and 99th percentiles to remove outliers.

Skill quartiles are assigned as follows: average years of education by occupation are calculated from the SOF 1992-2003; then quartiles are assigned based on aggregated occupational cells; these quartiles are then matched by occupation to the POEA micro data. Countries are included if they have OFWs in this skill category and non-missing data GDP data.

*** indicates significance at the 1% level. ** indicates significance at the 5% level * indicates significance at the 10% level.

SOURCE: POEA, WDI, SOF, and authors' calculations.

Table 4: Does who migrates vary with economic conditions at destination?

Characteristics of first-time migrants in Survey of Overseas Filipinos

	Mean Age	Median Age	Mean from Manila	Mean Female	Mean Married	Mean Education	Median Education
Log GDP	-4.888	-6.835	-0.209	0.089	-0.097	2.391	2.257
	(6.623)	(6.788)	(0.236)	(0.287)	(0.250)	(1.924)	(1.940)
Observations	369	369	369	369	369	331	331
R2	0.258	0.272	0.357	0.528	0.253	0.305	0.291
Mean of Dependent Variable	32.07	31.30	0.18	0.47	0.48	13.12	13.27

NOTES: The sample includes all contract hires in the Survey of Overseas Filipinos from 1992-2003 (only first time hires).

All regressions include country and year fixed effects. Robust standard errors clustered at the country level are in parentheses.

The unit of observation is the country-year.

*** indicates significance at the 1% level. ** indicates significance at the 5% level * indicates significance at the 10% level.

SOURCE: SOF, WDI, and authors' calculations.

Table 5. Effect of a Change in Domestic Helper Minimum Wage on Domestic Helper Hiring

Panel A. Non-Minimum Wage Countries as Control	Full Sample		Balanced Panel	
	Log Count	Log Wages	Log Count	Log Wage
Binding Increase in Minimum Wage	-0.605*	0.238***	-0.642	0.289***
	(0.341)	(0.073)	(0.392)	(0.074)
Obs	327	324	279	276
R2	0.918	0.907	0.910	0.942
Panel B. Other Industries as Control				
Binding Increase in Minimum Wage	-0.565**	0.377***	-0.641**	0.413***
	(0.225)	(0.057)	(0.240)	(0.058)
Domestic Helper	2.172***	-0.711***	2.717***	-0.710***
	(0.521)	(0.068)	(0.510)	(0.068)
Obs	1828	1814	1487	1481
R2	0.648	0.377	0.649	0.370

NOTES: The sample period is from 2001-2009.
All regressions include country and year fixed effects. Robust standard errors clustered at the country level are
In Panel A, columns 1 and 2 have 39 jobsites included in the estimates, and columns 3 and 4 use 31 jobsites.
In Panel B, 18 jobsites are included in the estimates in columns 1 and 2, and columns 3 and 4 use 14 jobsites.
Destination countries are included in the treatment group if they have a median wage less than
 $400 in 2006 (implying that the minimum wage change in 2007 would be binding for these destinations).
Industries are included in the control group if they fall in the top 16 other occupations. Each of these occupations have
>55,000 OFWs over the sample period, and together comprise 89% of all migration episodes over the sample period.
All wages are trimmed at the 1st and 99th percentile to remove outliers.
*** indicates significance at the 1% level. ** indicates significance at the 5% level * indicates significance at the
SOURCE: POEA, WDI, and authors' calculations.

ONLINE APPENDIX

for

"Distortions in the International Migrant Labor Market:

Evidence from Filipino Migration and Wage Responses to Destination Country

Economic Shocks"

David McKenzie

Caroline Theoharides

Dean Yang

This online appendix provides a number of robustness checks for the main results contained in the paper, as well as providing supplemental tables and figures referenced in the main text.

Robustness of Aggregate Impacts to Rehires, Lags, and Recessions

The quantity numbers we have are for new contracts issued. Typically new hires are 38% of the total contracts issued each year, with rehires constituting the remainder. Micro data on rehires was not available from the POEA, preventing us from examining the wages for this group. Nevertheless, annual destination country level data on total quantities of migrants are available from 1998 to 2009 in the POEA's Compendium of Overseas Foreign Worker Statistics (Philippine Overseas Employment Administration, 2005-2009). We subtract the total new hires from our micro data from these totals to obtain data on rehire numbers by year.

We use this rehire and total contract worker data to examine the robustness of our migrant quantity results to the measure of migrant flows used. Appendix Table 2 presents the results. First, column 1 re-estimates equation 1 on our micro new hire data over the shortened time period 1998-2009. The point estimate suggests an even higher elasticity of quantities to GDP over this shorter period, but we cannot reject equality with our point estimate over the full sample. Columns 2 and 3 then show the same elasticity for rehires and for total migrant contract workers respectively. The point estimates are positive and significant in both cases, and we cannot reject equality of the total and rehire responses.

The stock of migrant workers at origin depends on both the flows of migrant workers, and how long these workers stay. The elasticity of the stock of contract workers with respect to GDP may therefore deviate from that of the flow if the duration of contracts varies with economic conditions at origin. Our database contains the duration of each new contract issued, and in column 4 of appendix Table 2 we test whether the contract length (in months) varies significantly with GDP. The effect is statistically insignificant, and the point estimate is small, suggesting a 1 percent increase in GDP only increases contract duration by 0.16 months. As a result, we conclude that the stock of contract workers is likely to behave similarly to the flow in terms of its responsiveness to GDP.

Taken together, these results suggest that non-competitive labor market models of the type discussed in section 2.5, in which minimum wages act to reduce quit rates and vacancies and potentially increase employment are unlikely to be driving our results here.

We also examined the robustness of our results to issues of timing, to account for the possibility that labor demand reacts slowly to changes that have occurred in GDP. We do this by adding lags of log GDP to equation (1). We test for up to 5 lags, and do not find any significant lagged effect (Appendix Table 3). The effects of GDP on labor demand therefore appear to occur contemporaneously within the same year. A likely reason for this fast adjustment is the speed of the recruiting process in the Philippines – workers are often hired and working abroad within several weeks of initial demand from employers.

Finally, an alternative story for why adjustment occurs through quantities and not through wages could be that wages are sticky (Hall, 2005). However, in practice, most of our identification is coming from relative differences in positive growth rates across countries, with only 12 percent of our country-year observations reflecting negative growth. Nonetheless, as a check to ensure that sticky wages in recessions are not driving our results, we interact the impact of GDP with whether or not there is a recession, and show the results in Appendix Table 4. We find small and insignificant interactions with recessions, providing evidence that this is not driving our results.

Robustness to Country Choice

Appendix Table 5 examines the sensitivity of our results to the composition of countries included in our sample. The first row shows our base specification in Table 2. In the second row,

we test the sensitivity of our results to dropping Saudi Arabia, which is the only country in our sample which does not appear to impose any form of labor market test or minimum wage for migrant workers, and which is the number one destination for Filipino workers. The third row takes this further and drops the five GCC countries in our sample (Bahrain, Kuwait, Oman, U.A.E., and Saudi Arabia). In both cases our coefficients are of very similar magnitudes and of the same significance levels as with these countries included, showing our results are not being driven by these countries.

The fourth row drops Switzerland, the only country in our sample with a national quota limiting the total number of immigrants, which again leads to little change in the results. We then split the sample into countries which have at least a partial quota on migration, and those that do not. Both groups contain a mix of OECD and non-OECD countries. For example, countries with partial quotas include Ghana, Hong Kong, Taiwan, South Africa and Russia along with the United States, Norway, Spain and Sweden among others, while countries without partial quotas include Belgium, France, Finland and Japan along with Kuwait, Thailand, Micronesia and China among others.

For both subgroups we find a significant impact of GDP on migrant numbers, and no significant impact on migrant wages. Our simple theory model predicts that countries with binding quotas should experience relatively more adjustment through wages and relatively less through quantities. While the point estimates for wages are consistent with slightly more pro-cyclicality in countries with wages, the point estimates for quantities suggest, if anything, more adjustment of quantities in countries with partial quotas than those without. However, splitting the sample increases the standard errors, and the 95 percent confidence interval for the impact of GDP on migrant numbers for countries with some form of a quota ranges from -0.62 to 9.43. This lack of significant difference between partial quota and non-quota countries in their response may therefore just reflect low power, but could also be a result of the quotas only covering some occupations or sectors, and not always binding due to the dual imposition of minimum wage requirements for migrant workers through labor market tests.

As a final robustness check, the last row of appendix Table 5 provides results from a weighted regression, which weights each country by its 1992 log migrant count. This ensures that our results are not driven by countries with small absolute numbers of migrants having large

relative, but small absolute, changes. These coefficients again are similar in magnitude to the unweighted estimates, showing that our results are robust to this concern.

Taken together, these tests confirm the robustness of our findings, and show that migrant flows are procyclical with GDP at destination, whereas wages do not adjust to these destination GDP shocks. This result is not consistent with either a model in which the global market for migrant labor clears, nor with binding migrant quotas (in which adjustment would occur through wages). It is consistent with the main distortion being binding minimum wages, and means that workers both have an opportunity for substantial wage gains via migration, but also that migrant numbers will be very vulnerable to GDP shocks at destination.

Comparing Filipino Migrant with Native Wages

Additional supporting evidence for our claim that migrant workers face binding minimum wages in destination labor markets would be evidence that migrants typically earn wages equal to or exceeding those of native workers. Unfortunately, there are little data available that would allow us to compare the wages earned by Filipinos to those of natives in most of the main destinations for Filipino workers. That said, we can conduct this exercise for the United States, the 13th largest destination for Filipino labor migrants in the POEA data. We use data from the 2000 U.S. Census, restricting the sample to Philippine-born and U.S. native-born workers (aged 18-64) in the six most common occupations of Filipino-born workers in the US: registered nurse, nursing or home health aide, accountant, cashier, retail sales person, and maid. For each occupation separately, we estimate modified Mincer wage equations of log wages on years of education, experience, experience squared, and an indicator variable for being Filipino-born.

The results are in Appendix Table 6. In the pooled sample (with all occupations in the same regression, including fixed effects for each occupation), the coefficient on Filipino-born, representing the average log difference between the wages of Filipino-born and US native workers, is positive and significantly different from zero. The coefficient on "Filipino-born" is also positive and statistically significant in four of the occupation-specific regressions, indicating that Filipino-born workers earn more than native workers of the same education and experience in the occupations of registered nurse, home health aide, cashier, and maid. The Filipino-born coefficients in the regressions for accountants and retail sales persons are negative and statistically significantly different from zero, and in these cases they are the smallest in absolute

value of all the coefficients on "Filipino-born" in the table. Overall, we view these results are consistent with the idea that Filipino workers are typically not able to migrate to the U.S. and work for lower than the prevailing wages for native workers.

Appendix Figure 1: Real GDP Growth 1992-2009 in Top 10 Filipino Migrant Destinations
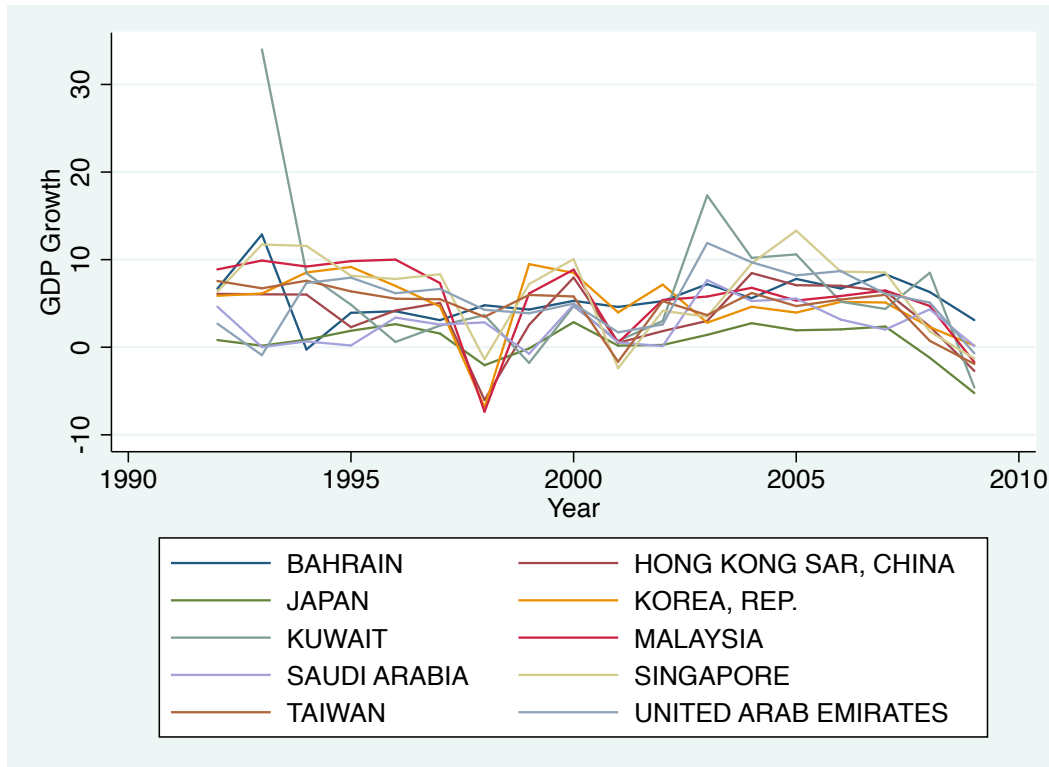
SOURCE: WDI and authors' calculations.

Scatterplots of the underlying variation in the data

Appendix Figures 2 and 3 provide scatterplots of the underlying variation behind our analysis, plotting demeaned log quantities of OFWs and demeaned log average wages respectively against demeaned log GDP, with a regression line of best fit presented.[1] Appendix Figure 2 shows considerable variation in both quantity and GDP deviations in the data, and a positive relationship with a slope slightly greater than one. In contrast, Appendix Figure 3 shows

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[1] Country-specific means are used in demeaning the data for these figures.

much less variation around the mean in wages than Appendix Figure 2 shows in migrant quantities, and a close to flat relationship with GDP deviations.

Appendix Figure 2:
Real Changes in GDP and Number of Migrants

Appendix Figure 3:
Real Changes in GDP and Wages
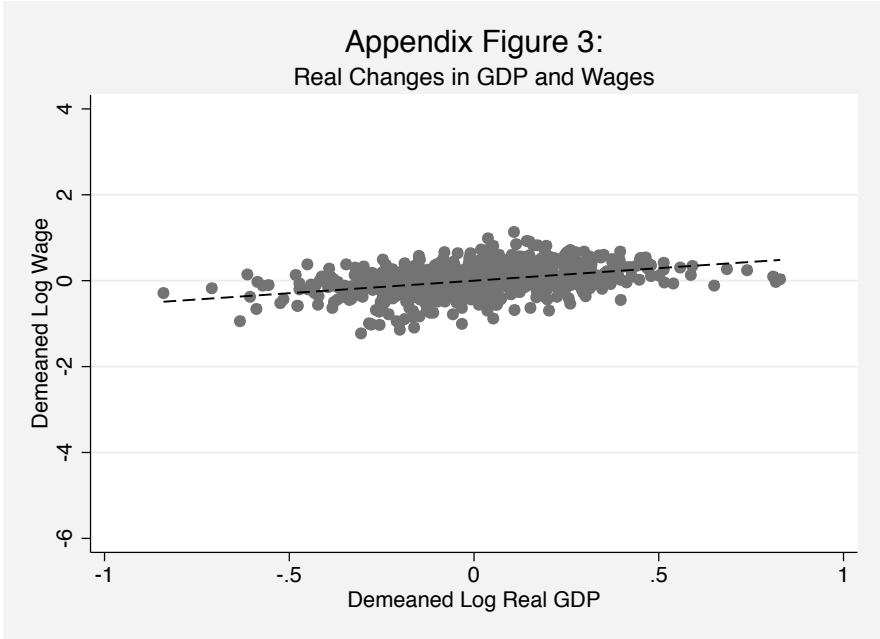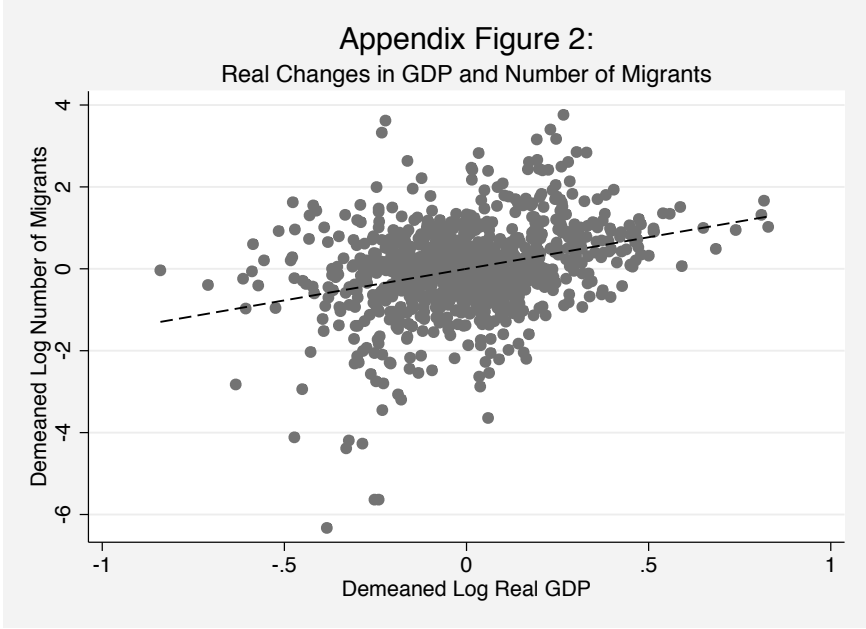
NOTES: The slope coefficient in Appendix Figure 2 is 1.54 with a standard error of 0.327. The slope coefficient in Appendix Figure 3 is 0.583 with a standard error of 0.106. Robust standard errors are clustered at the country level.

SOURCE: POEA, WDI, and authors' calculations.

Appendix 1: Included Destination Countries

Destination	Destination
1 SAUDI ARABIA	28 CUBA
2 JAPAN	29 CHINA
3 TAIWAN	30 YEMEN, REP.
4 UNITED ARAB EMIRATES	31 NEW ZEALAND
5 HONG KONG SAR, CHINA	32 MICRONESIA, FED. STS.
6 KUWAIT	33 GREECE
7 SINGAPORE	34 INDONESIA
8 KOREA, REP.	35 INDIA
9 MALAYSIA	36 VIETNAM
10 BAHRAIN	37 THAILAND
11 BRUNEI DARUSSALAM	38 SYRIAN ARAB REPUBLIC
12 CANADA	39 PAKISTAN
13 UNITED STATES	40 NETHERLANDS
14 ISRAEL	41 NORWAY
15 OMAN	42 SOUTH AFRICA
16 UNITED KINGDOM	43 GHANA
17 ITALY	44 MARSHALL ISLANDS
18 CYPRUS	45 SWITZERLAND
19 SPAIN	46 BELGIUM
20 JORDAN	47 SRI LANKA
21 ALGERIA	48 FINLAND
22 AUSTRALIA	49 GERMANY
23 PAPUA NEW GUINEA	50 AUSTRIA
24 ANGOLA	51 FRANCE
25 RUSSIAN FEDERATION	52 SWEDEN
26 SUDAN	53 SOLOMON ISLANDS
27 PALAU	54 FIJI

SOURCE: POEA and authors' calculations.

Appendix Table 2: Robustness Checks: Effect of GDP on New Hires, Rehires, Total OFWs, and Contract Duration

	New Hires	Rehires	Total OFWs	Contract Duration
Log GDP	2.624***	1.948***	2.155***	0.161
	(0.710)	(0.486)	(0.530)	(1.836)
Obs	648	647	648	972
R2	0.914	0.947	0.950	0.611
P-value of Equality of Hiring Status Coefficients		0.2446		
Mean Dependent Variable (Levels)	4663	7785	12448	17.21

NOTES: The sample for new hires, rehires, and total OFWs is from 1998-2009.

Rehires are calculated for each country-year by subtracting the number of new hires in the POEA micro data

from the total number of OFWs (compiled from POEA's 2005-2009 Compendium of OFW Statistics).

The sample for contract duration is from 1992-2009.
Countries are included if they have new hires and non-missing GDP data in each year from 1992-2009.
All regressions include country and year fixed effects.
Robust standard errors clustered at the country level are in parentheses.
The unit of observation is the country-year.
All wages are trimmed at the 1st and 99th percentiles.
*** indicates significance at the 1% level. ** indicates significance at the 5% level * indicates significance at the 10% level.
SOURCE: POEA, WDI, and authors' calculations.

Appendix Table 3: Lags of GDP are not jointly significant

	Quantity			Log Mean Wage		
Log GDP	2.741***	2.475**	2.716**	-0.164	-0.420	-0.501*
	(0.981)	(0.955)	(1.060)	(0.272)	(0.290)	(0.291)
Lag 1 Log GDP	-1.247	-0.722	-1.308	0.143	0.347	0.375
	(1.104)	(1.033)	(1.108)	(0.258)	(0.339)	(0.328)
Lag 2 Log GDP		0.452	1.071		0.606**	0.334
		(1.373)	(1.213)		(0.290)	(0.248)
Lag 3 Log GDP		-0.745	-0.995		-0.599**	0.184
		(1.148)	(1.286)		(0.247)	(0.286)
Lag 4 Log GDP			0.845			-0.014
			(1.137)			(0.364)
Lag 5 Log GDP			-1.111			-0.487*
			(1.136)			(0.275)
Joint Sig. of Lags (p-value)	0.26	0.74	0.59	0.58	0.11	0.16
Obs	971	965	955	966	960	950
R2	0.863	0.864	0.866	0.762	0.765	0.770

NOTES: The sample includes all new hires from 1992-2009.

All regressions include country and year fixed effects.

Robust standard errors clustered at the country level are in parentheses.

*, **, and *** indicate significance at the 10, 5 and 1 percent levels respectively.

Appendix Table 4: The Impact of GDP is no different in Recession Years

	Log Quantity of New Migrant Contracts	Log Median Wages Paid to Migrants	Log Mean Wages Paid to Migrants
Log GDP	1.529***	-0.104	-0.0969
	(0.503)	(0.176)	(0.147)
Log GDP*Recession	-0.0288	0.00757	-0.00197
	(0.0442)	(0.0112)	(0.00934)
Observations	918	914	914
R-squared	0.877	0.744	0.773

NOTES: The sample includes all new hires from 1992-2009.

All regressions include country and year fixed effects, and a dummy for whether the country had negative GDP growth in the current year.

Robust standard errors clustered at the country level are in parentheses.

*, **, and *** indicate significance at the 10, 5 and 1 percent levels respectively.

Appendix Table 5: Robustness to different country choices

	Number of Countries in Sample	Log Quantity of New Migrant Contracts	Log Median Wages Paid to Migrants	Log Mean Wages Paid to Migrants
Base Specification	54	1.522***	-0.063	-0.041
		(0.501)	(0.158)	(0.137)
Omitting Saudi Arabia	53	1.497***	-0.076	-0.049
		(0.502)	(0.160)	(0.138)
Omitting all GCC countries	49	1.537***	-0.060	-0.020
		(0.547)	(0.171)	(0.149)
Omitting Switzerland	53	1.447***	-0.034	-0.022
		(0.500)	(0.159)	(0.138)
Countries with full or partial quota	21	4.406*	0.129	0.204
		(2.409)	(0.347)	(0.304)
Countries with no quota	28	1.344**	-0.065	-0.070
		(0.589)	(0.217)	(0.179)
Full sample weighted by 1992 size	54	1.584***	0.118	0.0939
		(0.560)	(0.157)	(0.146)

NOTES: The sample includes all new hires from 1992-2009.

All regressions include country and year fixed effects. Robust standard errors clustered at the country level are in parentheses.

The unit of observation is the country-year, and all wages are trimmed at the 1st and 99th percentiles to remove outliers.

*** indicates significance at the 1% level. ** indicates significance at the 5% level * indicates significance at the 10% level.

SOURCE: POEA, WDI, and authors' calculations.

Appendix Table 6. Differences in Log Hourly Wages for Filipinos and Natives in Top Occupations in the U.S.

	Top 6 Occupations	Registered Nurse	Nursing or Home Health Aide	Accountant	Cashier	Retail Sales Person	Maids
Filipino-born	0.116***	0.225***	0.138***	-0.055***	0.068***	-0.087***	0.237***
	(0.007)	(0.008)	(0.017)	(0.017)	(0.020)	(0.023)	(0.025)
Educational Attainment	0.078***	0.061***	0.060***	0.131***	0.058***	0.091***	0.028***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Experience	0.028***	0.023***	0.017***	0.031***	0.023***	0.041***	0.012***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Experience Squared	-0.000***	-0.000***	-0.000***	-0.001***	-0.000***	-0.001***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	453315	96872	64673	63529	86737	115552	25952
R2	0.344	0.064	0.049	0.140	0.069	0.136	0.022

NOTES: Data are from the 2000 U.S. Census. The sample is restricted to include only individuals aged 18 to 64 born in the Philippines or the United States who report that they are currently employed. Each column reports coefficients from a regression of log hourly wages on an indicator for Filipino, educational attainment, experience (age minus years of education minus 6), and experience squared. The "Top 6 Occupations" wage regression includes occupation fixed effects for each of the 6 top occupations for Filipinos in the U.S. Remaining columns are wage regressions for each of the top 6 occupations separately. *** indicates significance at the 1% level. ** indicates significance at the 5% level * indicates significance at the 10% level.

SOURCE: IPUMS USA.