The Return Motivations of Legal Permanent Migrants: Evidence from Exchange Rate Shocks and Immigrants in Australia

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The Return Motivations of Legal Permanent Migrants: Evidence from Exchange Rate Shocks and Immigrants in Australia

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Why do legal permanent migrants return to their home countries? This paper uses exogenous exchange rate shocks arising from the 1997 Asian Financial Crisis to distinguish return motivations of Australian immigrants. A 10% favorable shock (a depreciation in home country currency) leads to a 0.37 percentage point reduced likelihood of return. The effect is stronger for those with pre-existing intentions to return, weaker for those undecided, and zero for those who initially desired to stay. The results favor a life-cycle explanation for migrant behavior and reject the theory that migrants are target earners who seek to invest upon return. (JEL: O15, F22, J15, J61)

Many individuals who live and work outside their countries of birth eventually return home. While official government statistics are often lacking, indirect estimates from different countries over time suggest considerable flows: Jasso and Rosenzweig (1982) for example suggest that more than 20 percent of immigrants chose to re-migrate from the US in the 1970s. Dustmann and Weiss (2007) approximate that 40% of all male immigrants and 55% of female immigrants left the UK after five years of arriving in the 1990s. Most recently, Gibson and McKenzie (2011) find that over a quarter of the "best and brightest" students who ever migrated from three Pacific countries ultimately ended up returning (33% in Tonga, 27% in Papua New Guinea, and 26% in New Zealand).

That migrants voluntarily choose to return in seemingly substantial numbers poses a puzzle. People move to where they earn the most, at least according to traditional economic theory (Sjaastad 1962; Harris and Todaro 1970). Hence, most return should occur when earnings in places of origin surpass those at the destination. Yet earnings in migrant-sending countries rarely overtake receiving countries'. There should be little or no return. Reality appears to defy this simple prediction.

More nuanced theories go beyond income maximization and appeal to the inclination of migrants to invest or consume in their home countries. Such theories allow for marginal changes in home country conditions to matter for migrant behavior, without wage level reversals. Two competing models are at the forefront: those that see migrants as target earners or life-cycle agents. As a target earner, a migrant is credit constrained, so she works abroad until she accumulates a sufficient level of savings to finance an enterprise upon returning home (as in Piore 1979 and Mesnard 2004). The primary motive is investment. As a life-cycle agent, a migrant weighs the marginal benefits of obtaining higher income in the host country versus the marginal costs of remaining overseas, since home country consumption is preferred (see for instance Stark, Helmenstein, and Yegorov 1997

or Dustmann 2003). The goal is to consume. The two have separate predictions on how migrants respond to home country factors. For example, a target earner is thought to cut her stay abroad *shorter* when her purchasing power for the home country increases while a life-cycle migrant makes her stay *longer*[1].

The empirical investigation for reasons of migrant return related to home country considerations is scant and limited to particular contexts. Governments seldom record the flow of migrants, let alone track their locations over time. Another impediment is the difficulty of isolating exogenous variation in factors that affect return, limiting the ability for causal inference. Most studies focus on correlations. Constant and Massey (2002), for example, relate covariates of social and economic attachments in the home country with migrant return and find that these are strongly associated for a sample of German guest workers. Kirdar (2013) demonstrates that German immigrants shorten their stays overseas when purchasing power increases for their home country. A chief concern with these studies, however, lies with omitted variable bias, as source country factors are possibly endogenous to variables that are unobserved. That migrants with more social attachments at home are more likely to return need not imply a causal relationship. The group may simply possess other unmeasured characteristics related to social attachments that make return appealing.

Yang (2006) perhaps comes closest to identifying the causal impact of changing home country conditions on return. To confront endogeneity, the author utilizes an unexpected event, the 1997 Asian Financial Crisis, when substantial and varied exchange rate shocks were realized between the Philippine peso and foreign currencies. Filipino migrants work in a diverse set of countries abroad so it was as if each of them were randomly allocated different exchange rate shocks during this period. By comparing the behavior of Filipino migrants who attained

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[1] This is true if the substitution effect dominates the income effects, as I show in the theory section.

[2] A standard deviation change in the exchange rate during this period is 29%.

[3] Perhaps because they do not have appetite for self-employment or simply do not have access to business ideas.

greater and smaller shocks, the paper establishes the causal impact of changing exchange rates on the decision of migrants to return home. Filipino migrants appear to be driven by life-cycle considerations. They prolong their stay abroad when they experience favorable changes to their purchasing power at home.

This paper focuses on Australian permanent immigrants and their motivations for return. I employ a strategy similar to Yang (2006) in using exchange rate shocks brought about by the Asian Financial Crisis, except I look at a mirror image: data from a destination country on immigrants from multiple origin countries. Doing so provides several advantages that complement previous research: First, because the source of variation is in places of origin rather than destination, I distinguish between the effects of exchange rate shocks from other home country shocks, such as changes in GDP and unemployment, that may also influence return. Second, I capture households whose members have all migrated and would have otherwise been absent in data collected from the home country, a limitation of Yang (2006). Third, Yang (2006) primarily focuses on Filipino migrants on temporary work contracts abroad. It is unclear whether his results must hold for other types of migrants as well, such as those granted permission for indefinite stay at the destination. For this set of individuals, a reasonable prior in fact is that there could be no motivation for return at all. I am able to test this hypothesis.

Australia is a natural setting to study migration because of its large immigrant community; 24.7% of its population is foreign-born. Most immigrants are legal permanent residents (as opposed to undocumented), whose immediate relatives are already present in the host country.

My main contribution is the finding that a 10% home country currency depreciation leads to a 0.37 percentage point reduction in the probability that a

migrant returns[2]. The 2-year permanent return rate in the period is 4.1%, so the effect is equivalent to almost 10% of the return rate. The result is robust and consistent with the story that migrants return because of life-cycle considerations. The effect is strongest for migrants who have pre-determined they want to return, weak for those initially undecided, and null for those who originally stated their desire to stay. This is evidence that migrants seek to optimally *time* their return, rather than *decide* whether or not to return, based on favorable conditions. Moreover, I show evidence that the effect of the exchange rate shocks is not merely a proxy for the influence of other macroeconomic conditions such as GDP per capita growth or the change in unemployment in the home country. Evidence suggests that return is more a function of purchasing power and consumption rather than employment possibilities in the origin country.

I. Theoretical Framework

What can responses to exchange rate shocks reveal about the motivations of migrants to return? I present here the life cycle and target earnings models, patterned after the models presented in Dustmann (2003) and Mesnard (2004). I highlight the role played by exchange rates in influencing migrant behavior.

Consider a migrant, who currently resides in a foreign country (Australia in this case) at time 0 and whose lifespan extends until time 1. For simplicity, assume that there is no discounting between periods, the interest rate equals zero, and perfect foresight is possible. Hence, given preferences for foreign and home consumption, $u_f(c_f)$ and $u_h(c_h)$, a migrant maximizes her lifetime utility by concurrently choosing the amount of consumption in the foreign country c_f, consumption at home c_h, and duration of stay abroad t, where $0 < t \leq 1$. Assume

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[2] A standard deviation change in the exchange rate during this period is 29%.

prices to be normalized to 1 in both countries. Further, assume that the migrant favors consumption at home to consumption abroad.

There exist two types of migrants: lifecycle consumers, who are only capable of being wage earners at home[3], and target earners, whose goal abroad is to accumulate resources in order to invest in a small business at home. The wage abroad for both types is w_f. An exchange rate E converts Australian currency to home country currency.

Upon return, a lifecycle migrant works for a wage w_h. A target earner, on the other hand, invests in a business that provides a high-income stream of y where $y > Ew_f > w_h$. Assume in this case that self-employment cannot be done simultaneously with working for a wage. In addition, starting a business requires collateral, C, which can only be financed through savings abroad. Credit constraints bind.

This difference between life-cycle consumers and target earners allows for deriving conditions such that the two are distinguishable from their responses to exchange rate shocks to their home country currencies.

A. Lifecycle Consumers

The maximization problem for a lifecycle consumer is as follows:

$$\max_{c_f, c_h, t} \ t u_f(c_f) + (1 - t) u_h(c_h) \text{ such that}$$

(1) $\qquad t c_f + S_t \leq t w_f$

(2) $\qquad (1 - t) c_h \leq (1 - t) w_h + E S_t$

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[3] Perhaps because they do not have appetite for self-employment or simply do not have access to business ideas.

where (1) and (2) are the budget constraints for the period spent abroad (t) and at home ($1 - t$). S_t represents accumulated savings up to time t. Considering for the moment only interior solutions, then (1) and (2) are satisfied with equality and (2) can be substituted into (1) for S_t.

The first order condition of the corresponding Lagrangian with respect to t is given by (3) where λ is the marginal utility of wealth:

$$(3) \qquad u_f(c_f) - u_h(c_h) + \lambda(Ew_f - w_h + c_h - Ec_f) = 0$$

The result is fairly intuitive. With a preference to consume at home, the life-cycle migrant balances the marginal cost of remaining abroad $u_f(c_f) - u_h(c_h)$ with the marginal benefit of earning higher abroad represented by the term $\lambda(Ew_f - w_h + c_h - Ec_f)$.

The optimal duration of stay abroad t^* evolves in response to a shock in E. Equation (4) describes the response

$$(4) \qquad \frac{dt}{dE} = \frac{-b\lambda(w_f - c_f)}{a^2} + \frac{at(w_f - c_f - E\frac{\partial c_f}{\partial E})}{a^2}$$

where $(w_f - c_f) \geq 0$ and $\frac{\partial c_f}{\partial E} < 0$ because of a first order condition, $b = Et\frac{\partial c_f}{\partial \lambda} + (1 - t)\frac{\partial c_h}{\partial \lambda}$, and $a = -(Ew_f - w_h + c_h - Ec_f)$. The details of the comparative statics exercise are in the Appendix but the proof is similar to Mesnard (2004). Since the marginal utility of wealth is positive and it can be shown that $b < 0$ and $a \leq 0$, the response to a favorable (positive) change to the exchange rate depends on two effects. First, a substitution effect, $\frac{-b\lambda(w_f - c_f)}{a^2} > 0$, induces the migrant to stay longer abroad; the shock provides an incentive to accumulate more resources

abroad. But an opposing income effect, $\frac{at\left(w_f - c_f - E\frac{\partial c_f}{\partial E}\right)}{a^2} < 0$, encourages the migrant to cut her stay abroad short because of the higher spending power permitted at home by an increase in E. While the sign of the total effect is ambiguous, the overall result, if the substitution effect turns out to dominate the income effect, is that migrants prolong their stay in the foreign country because of a favorable exchange rate shock. The prediction allows the identification of a life-cycle consumer because, as I show in the next part, a target earner does not quite respond to an exchange rate shock in the same way.

B. Target Earners

The corresponding optimization problem for a target earner is as follows:

$$\max_{c_f, c_h, t} tu_f(c_f) + (1 - t)u_h(c_h) \text{ such that}$$

(5) $\qquad tc_f + S_t \leq tw_f$

(6) $\qquad (1 - t)c_h \leq (1 - t)y + ES_t - C$

(7) $\qquad ES_t \geq C$

Consider here once again only interior solutions such that (5), (6), and (7), are satisfied with equality. In particular, note that at the optimum, $ES_t = C$. A migrant stays abroad only up to the point where her target savings are met. This makes sense: there is otherwise no point delaying return until $ES_t > C$ since investment at home fetches greater per period income y than w_f when consumption at home is preferred. But consider also the other possibility that the collateral C needed to start up a business is so high that it cannot be financed by accumulated savings even when the migrant stays abroad until the end of his life

$(w_f < C)$. Here, the migrant will simply revert to acting like a lifecycle consumer and solves the corresponding optimization problem.

The solution is straightforward and the details are left to the appendix. The first order condition that describes the optimal choice of t is given by (8).

$$(8) \qquad u'_f\left(w_f - \frac{C}{Et}\right)\left(\frac{C}{Et}\right) + u_f\left(w_f - \frac{C}{Et}\right) - u_h(y) = 0$$

Consequently, the change in t^* that results from a change in the exchange rate amounts to

$$(9) \qquad \frac{dt}{dE} = -\frac{t}{E}$$

This is always negative. Hence, for target earners, a favorable exchange rate shock leads to an unambiguous shorter stay abroad.

To summarize, if the motivation of a migrant for return is mostly to invest, then her expected response to a favorable exchange rate shock is to *shorten* her stay abroad. Observing otherwise allows us to reject the target earnings model in favor of one where the migrant is dominated by life-cycle considerations and the concern is primarily to consume. In such a model, a migrant *lengthens* her stay abroad at the onset of a favorable exchange rate shock if the substitution effect dominates the income effect. But it is of course equally plausible that the return decisions of migrants do not at all respond to exchange rate shocks, in which case migrants may not actually prefer consumption at home (a starting assumption) or that the solution to the above models are at the corner and $t^* = 1$.

These observations inform the interpretation of the results that will come from the empirical section. I provide evidence that legal permanent migrants in

Australia are likely to be life-cycle consumers and do in fact respond to home country considerations.

II. The Asian Financial Crisis of 1997 and its Impact on Australia

While few observers had hinted at the possibility of a crash[4], the crisis that eventually beset the booming East and Southeast Asian economies of the 1990s is largely regarded to have been unexpected. Telltale signs were, at least, absent: savings rates were high, inflation was low, and fiscal accounts were balanced (Radelet and Sachs 1998). Credit agencies such as Standard and Poor's and Moody's provided no indication of changing risk in country ratings until after the crisis had begun.

The Asian Financial Crisis that hit is credited to have officially started in July 1997 with the devaluation of the Thai baht. The event triggered a wave of capital flight from the region as foreign investors withdrew funds, speculating on the weakness of surrounding economies. Five countries were most affected: Thailand, Indonesia, South Korea, Malaysia, and the Philippines. In the year before the crisis, inflows of foreign capital into these countries amounted to $97.1 billion. In just a year after, outflows were estimated to be $18.1 billion (Radelet and Sachs 1999). Hong Kong, Singapore, Taiwan, and Laos suffered considerable economic losses as well, albeit to a lesser degree. Currency devaluations followed. What economic analysts had previously dubbed the "Asian Economic Miracle" had come to an end.

For the most part, Australia came out unscathed. Diminished regional demand for its exports was a brief concern, but while exports did subsequently decline (Gunawardana 2006), the impact on the local economy was negligible. Real GDP

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[4] See, for instance, Park (1996) who warned about the excessive influx of foreign capital into East Asia. He suggested that it was both speculative and short term and that some controls might be necessary to discourage capital movements.

continued to grow by 4.0% during 1997-98, up from 2.8% in the previous period; unemployment fell from 8.7% to 8.3%; and private consumption and business investment actually rose by 4.6% and 11.6% from the previous year.[5] Makin (1999) attributes the resilience to the switching of international capital out of Asian markets into Australasian and other markets. The flows kept interest rates low and asset values high in advanced economies.

The Asian Financial Crisis makes for a compelling natural experiment. That Australia was relatively unaffected holds constant the local economic conditions faced by immigrants in the country. But since these migrants come from a variety of backgrounds, each effectively experienced different home country shocks from the crisis. Thus, an approach to understand what motivates return is to observe which migrants were more likely to come back, by comparing the behavior of those faced with different shocks. Most notable among shocks were exchange rate changes that occurred between home country currencies and the Australian dollar. Migrants had their home country currencies appreciate or depreciate to varying degrees in a way that was unexpected and plausibly random.

Figure 1 depicts the exchange rates during the time of the Asian Financial Crisis between the Australian dollar and foreign currencies of the top 15 home countries of migrants in the data. The exchange rates are expressed in foreign currency over Australian dollar (e.g. PHP/AUD) and are normalized to 1 in January 1996 for ease of comparison. An increase represents foreign currency depreciation with respect to the Australian dollar, and signifies a higher purchasing power for the migrant looking to come home. A structural break in trends occurs around July 1997, the start of the crisis. Variation around this period is what the study exploits.

[Insert Figure 1 Here]

III. Data and Descriptive Statistics

I employ data from the Longitudinal Survey of Immigrants to Australia (LSIA1), a nationally representative study of principal immigrant applicants issued permanent visas offshore and arrived in Australia between 1993 and 1995.[67] The survey was conducted in three waves of interviews and I focus on the 2nd and 3rd waves, which were implemented from 1995-1997 and 1997-1999 respectively. This nicely corresponds to years prior to and after the Asian Financial Crisis. The main sample thus consists of 3069 principal immigrants aged 15 to 60 years old who have identifiable countries of birth and historical exchange rate data available for their origin countries.

As part of its migration program, the Australian government allocates permanent visas under five broad categories: the Preferential Family, Concessional Family, Business Skills and Employer Nomination Scheme, Independent, and Humanitarian. The labor market has always played a crucial role in this structure. Applicants under the independent and concessional family streams are subject to a points test, where they are allocated points by satisfying criteria deemed in demand by the labor market (such as age, education, experience, English language ability, etc.). Visa eligibility is determined by passing a predetermined threshold of points. Employment Nomination is reserved for firms sponsoring workers. On the other hand, Business Skills are granted for entrepreneurs who have invested a certain amount of capital in the country. The Preferential Family and Humanitarian visa streams are the only categories that do not depend on economic circumstances. The former is reserved for close relatives

[6] The source of the data is the Department of Immigration and Citizenship of the Australian Government. http://www.immi.gov.au/media/research/lsia/lsia01.htm#x1.

[7] The survey excludes New Zealanders who comprise majority of immigrant inflows to Australia.

of Australian citizens or permanent residents while the latter are for refugees and their family members. The number of visas issued per year is capped. For 1993-1994, the total number granted for all streams was 76,870 (Phillips, Klapdor, and Simon-Davies 2010).

[Insert Table 1 Here]

Table 1 describes the resulting composition of immigrants in the main sample. Those that come are typically young (aged 33), married, and well educated (42% have at least a bachelor's degree). Australian immigrants obtained legal residence most commonly through family sponsorship, and they arrive initially with a significant amount of funds (over 25,000 AUD on average). Majority of principal applicants declare typical household members to be present with them in Australia by 1995-1997. 60% of households do not have members remaining in their home countries. The number increases to 71% if one only considers close relatives (spouse, son, or daughter). Only 19% sent money to relatives or friends overseas in the course of the past 2 years.

Immigrants to Australia come from a diverse set of countries. Table 2 presents a tabulation of individuals from the top 15 source countries in the sample. England is the primary source with 281 individuals, but countries are fairly evenly represented. Asian countries most affected by the 1997 crisis (Indonesia, South Korea, Thailand, Malaysia, the Philippines) take up a considerable share.

The analysis assigns migrants exchange rate shocks by calculating the change in their home country exchange rate that occurred in the period between their wave 2 and wave 3 interviews.[8] I follow Yang (2006) in using nominal instead of

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[8] Specifically, I compute the average exchange rate a year prior to a migrant's interview date in wave 2 and correspondingly for wave 3 then calculate the percentage change between periods by subtracting log values of the former from the latter. Alternatively, computing exchange rate shocks by simply calculating the change in the exchange rates between waves 2 and 3 *at the exact day* the migrants were interviewed does not change the results of the analysis. For

real exchange rates since data on the former are available at a daily frequency, allowing for the exchange rate changes to be calculated exactly prior to and after interview dates. Daily historical exchange rates were obtained online from Oanda Corporation.[9] The exchange rates are expressed in home country currency over Australian dollars such that an increase represents a depreciation of the home currency while a decrease signifies an appreciation with respect to the Australian dollar. Increases in the exchange rate can be thought of as favorable to immigrants since it raises the foreign currency value of earnings when utilized for home country consumption.

[Insert Table 2 Here]

How were country currencies of migrants affected by the Asian financial crisis? The last column of Table 2 calculates mean exchange rate shocks experienced by individuals from origin countries going from wave 2 to 3 of the survey. On average, country currencies depreciated by 10% with respect to the Australian dollar, but the shocks were varied. A number of countries saw their currencies appreciate. Some even experienced extreme changes: with Bulgaria's currency depreciating by 310%, Turkey by 112%, and Romania by 98%. I continue to include migrants from all these countries in the analysis for lack of any objective rule to exclude them, but I conduct robustness checks to show that the results do not rely on their presence.

The outcome variable of interest is return migration captured by an attrition indicator, described in Table 3. Enumerators noted the reason a respondent could not be interviewed in a particular wave. If the respondent was found absent, they asked a friend or relative most likely to know about the respondent's

migrants who were not interviewed in wave 3 and were therefore not assigned an interview date, I assume a most likely interview date. This is taken from the interview group they belonged to and I use the mean interview date of that group.

[9] http://www.oanda.com/currency/historical-rates/ (accessed March 2013)

whereabouts. I use "Overseas Permanently" as the indicator for return, assuming that this accurately reflects return migration. It is distinct presumably from "Overseas Temporarily" which describes visits home or trips to other countries.

[Insert Table 3 Here]

Measuring return migration in this manner makes the analysis susceptible to measurement error. For instance, "Overseas Permanently" could mean that the migrant moved to another country overseas instead of back to the home country. I discuss later the implications of such threats and present robustness checks to verify that results are insensitive to relaxing measurement error assumptions.

IV. Empirical Results

The main equation I estimate is as follows:

(10) $$RETURN_{ic} = \alpha + \beta_1 \Delta lnERATE_{ic} + \beta_3 \Delta YEARS_{ic} + \beta_4 YEAR_{ic} + \varepsilon_{ic}$$

where $RETURN_{ic}$ is a dummy indicating whether migrant i from country c returned between waves 2 and 3 and $\Delta lnERATE_{ic}$ is the percentage change in home country exchange rate between interviews. β_1 is the coefficient of interest, indicating the effect of a 1% increase in exchange rates on the probability of return. Since the number of years between interviews varied per migrant, I account for this by including $\Delta YEARS_{ic}$, although this is typically two for most. $YEAR_{ic}$ are year dummies which indicate when the interview for wave 2 was conducted for migrant i. This is either 1995, 1996, or 1997 and allows for time trends in migrant return. ε_{ic} is the disturbance term which is assumed to be uncorrelated with $\Delta lnERATE_{ic}$. I cluster standard errors at the country level to

allow ε_{ic} to be correlated between individuals interviewed at the same time who are from the same origin country.

Potential omitted variables might still be a worry in this specification. In particular, certain migrant households might just happen to have been differently impacted by the Asian Financial crisis in a way that is correlated with both their exchange rate shock and return. This is a violation of the exogeneity assumption and biases the estimate of β_1. Hence, I estimate an augmented equation (11) that includes, $\boldsymbol{X_{ic}}$, a vector of controls for migrant and household characteristics recorded pre-crisis for each individual (refer to Panel A and B of Table 1 again for the list of covariates). I also include country of origin variables that incorporate information on common language and colonial history with Australia, distance from Sydney, GDP per capita, and indicators for whether the country is included in the list of those hardest hit by the Asian financial crisis.[10]

$$(11) \quad RETURN_{ic} = \alpha + \beta_1 \Delta lnERATE_{ic} + \beta_3 \Delta YEARS_{ic} + \beta_4 YEAR_{ic} + \boldsymbol{\beta_5 X_{ic}} + \varepsilon_{ic}$$

If $\Delta lnERATE_{ic}$ is indeed exogenous, then the estimate of β_1 should be unaltered by the addition of controls. To the extent that these controls also help explain return migration, their inclusion should make estimates of β_1 more precise.

A. Main Result

Table 4 produces estimates of β_1 using OLS. The 1st column begins with a specification that excludes control variables but I progressively introduce a set of country of origin, household, and migrant characteristics as covariates. The

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[10] Data on common language, colonial history, and distance are taken from the GeoDist database at CEPII, http://www.cepii.fr/anglaisgraph/bdd/distances.htm (accessed on July 5, 2013). GDP per capita data are from the World Development Indicators of the World Bank, http://data.worldbank.org/data-catalog/world-development-indicators (accessed on July 5, 2013).

exchange rate shocks are negatively related to the probability of return. When Column 2 includes the log of GDP per capita of the migrant's origin country as a control, the estimated impact diminishes but remains negative and statistically significant. It turns out that log of GDP per capita is an important control variable since migrants from richer countries are more likely to return but also happen to experience more negative exchange rate shocks (an appreciation in their currencies) than poorer countries during the financial crisis.[11] Accounting for this, however, does not completely overturn the result. The negative estimate remains robust to including a host of additional controls on country of origin, household, and migrant characteristics in columns 3, 4, and 5. There is no evidence that certain types of individuals or households were impacted differentially by the financial crisis in Australia in a way that is correlated with their experienced exchange rate shocks.

[Insert Table 4 Here]

A 10% increase in the exchange rate leads to a 0.37 percentage point decline in the probability that a migrant returns. This is not trivial, provided that a standard deviation change in the exchange rate during the period was 0.29, while the permanent return rate was 4.1%. The effect accounts for almost 10% of the return rate. Legal permanent migrants remain sensitive to home country conditions. As the value of their foreign wages and savings increase with respect to home country currencies, they stay longer at the destination. Hence, life-cycle considerations appear to dominate target-earning motives. Yang (2006) finds the same for his sample of overseas Filipino migrants, mostly temporary contract workers abroad with family members remaining behind. That this effect generally holds for a sample of migrants in Australia is a new finding. These individuals

[11] The correlation between $\Delta\ln ERATE$ and $\ln(\text{GDP per capita})$ is -0.18.

have permanent residence status and hold the option to stay, but they appear to remain influenced by home country considerations.

B. Differential Effects by Intention to Return

Next, I investigate whether the effect of the exchange rate shocks varies depending on the subgroup considered. LSIA1 asked individuals at baseline, prior to the crisis, whether they intend to return to their home countries sometime in the future. Possible answers included: 'yes', 'no', and 'not sure'. I look at whether the exchange rate shocks had varying impacts between individuals with different answers to this question. To do this, I re-estimate equation (11) with interaction terms for intention to return and the exchange rate shocks. Table 5 below presents the results with different specifications that include or leave out certain controls, while always controlling for country of origin variables, including log GDP per capita which has been found to be important. Migrants who stated no intention to return are the reference group.

[Insert Table 5 Here]

As expected, those who were unsure or stated their desire to return at the onset were more likely to return in wave 3 versus those who said they did not want to return. I cannot reject the null hypothesis that changing exchange rates had no effect on those who had no plans to return. On the other hand, favorable exchange rate shocks to migrants seem to have considerably delayed the return of those who have initially expressed desire to do so. Thus, exchange rate shocks seem to operate most at the level of changing the timing of return and less on the decision to return. But action at the extensive margin also exists, at least for the undecided. A favorable shock reduces the probability of return, albeit with a smaller magnitude, for migrants who were unsure of return at the beginning.

In regressions not shown, I further investigate differential effects of the exchange rate shocks by a migrant's pre-crisis income level and country of origin GDP per capita. The coefficient estimates turn imprecise but generally show that increases in exchange rates accompany a reduced likelihood of return for all income categories and country of origin GDP per capita.

C. Are Exchange Rate Shocks Merely a Proxy for Other Macroeconomic Variables?

A concern about the previous regressions might be that the exchange rate shocks merely proxy for other macroeconomic shocks that occurred simultaneously in home countries during the financial crisis. In other words, since exchange rate changes were potentially correlated with variation in GDP per capita growth, unemployment, or prices, then it could be these variables influencing return and not the higher purchasing power resulting from the exchange rates. A direct test then would be to include these macroeconomic variables in estimating the main regression equations and observe if the estimated impact of the exchange rate changes. Table 6 displays the results of implementing such an analysis including GDP per capita growth and changes in unemployment in the home country between waves 2 and 3. Table 7 does the same for prices as computed from the CPI.[12] I use only observations without missing values in all indicators to hold the sample constant across regressions.

[Insert Table 6 Here]

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[12] Because data on GDP per capita, unemployment, and CPI are only provided as yearly averages, I cannot compute the change in these variables that occurs exactly between interview dates for the migrants, in the same way I did for the exchange rate for which daily data was available. I settle for using a weighted measure in calculating the changes for these variables. For instance, if a migrant was interviewed on March 1995 for 2nd wave, I assign her country's GDP per capita on that date as ¼ the value of the measure for that year's plus ¾ the value of the previous year's. I then do the same for the 3rd wave interview. The resulting change in GDP per capita is going to be the log difference between the two waves. To be consistent, I recalculate the exchange rate shock measures in the same way for these sets of regressions.

The main result is insensitive to the inclusion of changes in GDP per capita or unemployment in Table 6. Column 1 replicates the main regression for the smaller sample. In column 2, higher GDP per capita growth in the home country appears to increase the likelihood that migrants return, but this effect disappears once the exchange rate shock is accounted for. In column 3, home country unemployment is unrelated to return. No matter how one includes other macroeconomic variables considered here as controls, the effect of the exchange rate shocks is robust.

But the finding provides additional insight. In all regressions, exchange rate changes appear to be the most important determinant of return. Purchasing power and consumption appear to explain migrant return better than employment opportunities and prospects at home. While conventional wisdom might claim that migrants return because of a booming home country economy, it seems refuted by the above evidence.

[Insert Table 7 Here]

Table 7 shows how changes in the general price level in the home country are related to return. Column 1 is again a replication of the main result while column 2 shows that changing prices demonstrates a similar effect on return as much as exchange rate shocks. Including both variables in the same regression in column 3 keeps the point estimate for the effect of the exchange rate shock unchanged but precision is lost (it is now significant only at the 14% level). It reverses the sign for the effect of a price change and estimates it to be virtually zero. I interpret this as evidence that price changes serve merely as proxies of the exchange rate shocks.[13] It appears that including price changes in the regression takes away

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[13] In fact, when I re-estimate this regression using a more precise measure of the exchange rate shock that occurred exactly between interview dates from wave 2 to 3, the coefficient on the exchange rate shock is statistically significant and the same from column 1 even when including the change in the CPI as a control.

useful variation in the exchange rate while not essentially affecting the return decision, making coefficient estimates imprecise.

V. Robustness Checks

The previous analysis relies on the assumption that exchange rate shocks during the Asian Financial Crisis were unexpected and exogenous. If such holds, then estimates above of β_1 are correctly interpreted as causal effects. I have controlled for as many possible confounding factors as the data permits. In this section, I provide additional robustness checks.

Future exchange rate shocks may be systematically related to past migration trends so that the effect is merely capturing pre-existing trends. For instance, migrants exposed to appreciations in their home currency and actually returned could simply belong to countries in the past that have high propensities for return. I conduct two tests to address this concern. First, I run a placebo test where I regress future exchange rate shocks on past return migration. Future exchange rate shocks should not systematically predict return migration in the previous period. Second, I re-estimate equation (11) adding lagged values for previous exchange rate shocks. The tests verify that the exchange rate shocks during the Asian Financial crisis do not merely reflect past trends.

Table 8 presents the falsification exercise. On Panel A, I regress the exchange rate shocks from the Asian financial crisis on the return indicator calculated from wave 1 to wave 2 of the survey. On Panel B, I regress the return variable from wave 2 to wave 3 on future exchange rate shocks calculated from wave 3 to 2 years after. In both cases, I cannot reject the null that future exchange rate shocks predict past return.

[Insert Table 8 Here]

Table 9 presents the results when I account for lagged exchange rate shock variables. These variables are always computed using 2-year changes in the exchange rate in order to conform to the exchange rate shock measured between wave 2 and 3, which are typically 2-year changes. Column 1 provides the baseline result from main table again for comparison. I restrict the sample to those with observations for lagged periods of the exchange rate shock to achieve consistency with the subsequent columns. Columns 2 and 3 include lagged variables one period before and two periods before as regressors. The point estimate for the coefficient of ΔlnERATE is unchanged in both. In column 4, I run a regression controlling for the long-term trend in country exchange rates, specified as the change in exchange rates for the past 10 years. In column 5, I control for a future exchange rate shock, measured as the change 2 years after the last year of interview. The conclusion from the baseline result remains unchanged. These regressions show that the effect of exchange rates does not merely reflect past trends; it is contemporaneous exchange rate shocks that influences return migration. In some way, this validates the focus on the period prior to and after the Asian Financial Crisis. It is during this window that shifts in the exchange rate appear to be unrelated to past trends, hence likely to be exogenous to migrants who were faced with them.

[Insert Table 9 Here]

A second concern is that outliers may be driving the results. Recall, certain countries had their currencies depreciate by as much as 100% during the period vis-à-vis the Australian dollar. Table 10 depicts what happens to the main regression when extreme observations are systematically dropped from the data. Column 1 again uses the full sample. Column 2 drops the migrants from the top 3 countries with the most extreme currency depreciations (Bulgaria, Turkey, and

Romania) and column 3 drops the top 5 (adding Nigeria and Venezuela). Column 4 drops migrants who obtained above the 99th percentile of the exchange rate shock while columns 5 and 6 trim those above the 95th and 90th percentile respectively[14]. In all six cases, the effect of the exchange rate shock remains negative and significant with some evidence that trimming for extreme values even magnifies the effect. Outliers appear not to be driving the result.

[Insert Table 10 Here]

A third concern involves measurement error. The dependent variable, return, relies on information from a friend or relative of the migrant that she returned "overseas permanently." There are conceivable ways in which this report might be inaccurate. "Overseas permanently" could reflect other reasons for attrition that the friend or relative was unaware of. It may also capture instances of migrants being overseas, only for a temporary trip or moving permanently to another country. Because return is used as a dependent variable, measurement error in which return is randomly misreported in a way unrelated to exchange rate shocks, is less of a concern since this merely introduces noise, and OLS coefficient estimates remain consistent. What would introduce bias are instances in which the error in measurement is systematically related to the exchange rate shocks.

In the analysis, "overseas permanently" was interpreted to mean return home but could also mean that the migrant moved to another country permanently. To be a threat to identification though, it must follow that permanently migrating to other countries is somehow systematically determined by home country exchange rates. I cannot fully rule out this possibility yet it is improbable that this could yield the estimates that I find. For this explanation to fully account for the results,

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[14] The 99th percentile exchange rate shock is 1.2; the 95th percentile is 0.73; and the 90th percentile is 0.29.

for example, those who moved to *another* country should also have had larger appreciations in the currency of their place *origin* than those who did not move. This is quite unlikely on two counts. One, almost zero percent of respondents in wave 2 said that they "expect to immigrate to another country [aside from their former country] in the future." The response to this question is tabulated in Table 11. Even dropping these individuals in the analysis has no effect on the results. Second, the fact that the exchange rate shocks had the most effect on those who said they intend to return to their home country during the baseline makes it improbable that migrants were moving elsewhere. Thus, while "overseas permanently" perhaps captures movement to other countries as well, this measurement error most realistically introduces itself as random noise. The fact that the regressions are still able to measure the parameter of interest with statistical significance suggests this is not a huge concern.

[Insert Table 11 Here]

Another possibility is that measurement error, arising from other reasons of sample attrition listed in Table 3, is driving the results. It may, for instance, coincidentally happen that those who were noted as "unable to track" contain those who have left for home permanently, in a way that is also related to the exchange rate shocks. At the same time, migrants traveling home could be systematically mistaken as permanent returnees when they are in fact merely visiting.

There is little evidence, however, that exchange rate shocks are related to any of these other reasons for attrition. Table 12 presents such an exercise where I regress each of these other reasons for attrition on the exchange rate shock. Only "out of scope" appears to be predicted by the exchange rate shocks with some statistical significance, and even then, the association is virtually zero. Further, if I

redo the analysis and expand the definition of return migration to include "overseas temporary" instead of just "overseas permanently," the results are qualitatively unchanged. These results are excluded in this paper but are available upon request.

[Insert Table 12 Here]

VI. Conclusion

The United Nations estimates that more than 232 million people (around 3% of the world's population) are international migrants.[15] Economists are just starting to understand how this growing group continues to relate to the countries where they are from. Remittances remain at the center of the conversation because of their magnitude. The developing world received $435 billion in remittances from international migrants in 2014 according to estimates by the World Bank.[16] But return migration is another potentially important avenue countries stand to benefit from. It is, however, less understood.

Migrant sending countries often lament the loss of their skilled nationals because many obtain legal permanent residence in rich countries. For this reason, return migration is often viewed positively and pursued by national governments. A returnee theoretically makes newly acquired skills, knowledge, and connections from working abroad available in the domestic economy; he invests his accumulated savings from overseas in the home country. But how might governments encourage return and maximize gains from such events? Effective policy depends in part on understanding precise motivations. Target earners benefit from the expansion of credit markets. For example, loans at subsidized

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[15] http://esa.un.org/unmigration/documents/The_number_of_international_migrants.pdf (accessed Jan 31, 2015)

[16] http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1288990760745/MigrationandDevelopmentBrief23.pdf (accessed Jan 31, 2015)

rates hasten return and facilitate the start-up of local businesses. On the other hand, such policies may be ineffective for life-cycle migrants. If return is indeed desired, then governments might do better by identifying consumption preferences and promoting them. To my knowledge though, the evaluation of these kinds of programs is lacking and requires additional research.

In this paper, I examined the return motivations of legal permanent migrants in Australia. Such individuals are well educated and mostly have their entire families present with them abroad. Despite this, I find that they continue to be influenced by home country factors in their decision to return home. A 10% decline in home country exchange rate increases the likelihood of return in a two-year period by 0.37 percentage points. This explains almost 10% of the return rate. The finding is comparable, yet smaller, to what Yang (2006) uncovers for temporary Filipino workers abroad. In that study, exchange rate shocks account for 20% of the return rate in a 12-month period.

My results support a lifecycle explanation, where returnees are concerned mostly about consumption rather than investment or employment possibilities in their home country. I cast doubt that migrants, at least those similar to legal permanent migrants considered here, form a vast army of entrepreneurs who generate business activity when they return. They may not be interested in investment, as countries might hope. Nevertheless, their contribution may lie elsewhere and deserve further examination.

Looking at subgroups, I find that those with predetermined expectations to re-migrate in the future are most responsive to exchange rate shocks, followed by those undecided. Such evidence suggests that migrants time their return to favorable conditions. Unsurprisingly, those who stated no intention of re-migration beforehand do not seem to react to exchange rate shocks at all.

While return migration provides a peek into the economic lives of immigrants, further research is necessary for understanding what influences other behavior,

and how this continues or ceases to be tied to home country factors. Nekoei (2013) is a recent paper in this area and considers how the earnings and labor supply of US immigrants are affected in real time by home country exchange rates. Other fruitful areas to investigate are economic decisions such savings and expenditures that may be affected by home country shocks. The endeavor would ultimately generate a better picture of what motivates international migrants since return migration is unlikely to be decided in isolation to other equally important economic factors.

APPENDIX

A. Comparative Statics for the Optimization of the Life-cycle Migrant

The optimization problem can be reduced to:

$$\max_{c_f, c_h, t} t u_f(c_f) + (1 - t) u_h(c_h) \text{ such that}$$

(1) $$t E c_f + (1 - t) c_h = t E w_f + (1 - t) w_h$$

The first order conditions of the Lagrangian are provided by the following equations:

(2) $$u_f(c_f) - u_h(c_h) + \lambda \left(E w_f - w_h + c_h - E c_f \right) = 0$$

(3) $$u'_f(c_f) = E\lambda$$

(4) $$u'_h(c_h) = \lambda$$

(5) $$-t \left(E w_f - w_h + c_h - E c_f \right) + c_h - w_h = 0$$

Taking the total derivatives of (2) and (5) yields

(6) $$\left(E w_f - w_h + c_h - E c_f \right) d\lambda = -E\lambda dw_f + \lambda dw_h - \lambda \left(w_f - c_f \right) dE$$

(7) $$-\left(E w_f - w_h + c_h - E c_f \right) dt = \left[-tE \frac{\partial c_f}{\partial \lambda} - (1 - t) \frac{\partial c_h}{\partial \lambda} \right] d\lambda +$$
$$t E dw_f + (1 - t) dw_h + t \left(w_f - c_f - E \frac{\partial c_f}{\partial E} \right) dE$$

Define $a = -\left(Ew_f - w_n + c_n - Ec_f\right)$ and $b = \left[tE\frac{\partial c_f}{\partial \lambda} + (1-t)\frac{\partial c_h}{\partial \lambda}\right]$. Then if we let $dw_f = dw_h = 0$ and substitute (6) into (7), the resulting equation is

(8) $$\frac{dt}{dE} = \frac{-b\lambda(w_f - c_f)}{a^2} + \frac{at(w_f - c_f - E\frac{\partial c_f}{\partial E})}{a^2}$$

$a \leq 0$ because the migrant cannot consume more than her foreign wages abroad $(w_f \geq c_f)$ and consumption at home must at least equal to wages and savings from abroad $(c_h \geq w_h)$. At the same time, $b < 0$ because it can be shown that both $\frac{\partial c_f}{\partial \lambda}$ and $\frac{\partial c_h}{\partial \lambda}$ are negative from the first order conditions (3) and (4).

B. Comparative Statics for the Optimization of the Target earner

The optimization problem can be reduced to:

$$\max_{c_f, c_h, t} t u_f(c_f) + (1-t)u_h(c_h) \text{ such that}$$

(9) $$tc_f + S_t = tw_f$$

(10) $$(1-t)c_h = (1-t)y + ES_t - C$$

(11) $$ES_t = C$$

From (9), (10), and (11), it is easy to solve for optimal c_f and c_h.

$$c_f = w_f - \frac{C}{Et}$$

$$c_h = y$$

Plugging these values into the objective function and taking the first order condition with respect to t produces

(12) $u'_f \left(w_f - \frac{c}{Et} \right) \left(\frac{c}{Et} \right) + u_f \left(w_f - \frac{c}{Et} \right) - u_h(y) = 0$

It follows that

(13) $\dfrac{dt}{dE} = -\dfrac{t}{E}$

REFERENCES

Constant, Amelie, and Douglas S. Massey. 2002. "Return Migration by German Guestworkers: Neoclassical versus New Economic Theories." *International Migration* 40(4): 5-38.

Centre d'Études Prospectives et d'Informations Internationales (CEPII). "GeoDist Database." http://www.cepii.fr/anglaisgraph/bdd/distances.htm (accessed on July 5, 2013).

Dustmann, Christian. 2003. "Return migration, wage differentials, and the optimal migration duration." *European Economic Review* 47(2): 353-369.

Dustmann, Christian, and Yoram Weiss. 2007. "Return Migration: Theory and Empirical Evidence from the UK." *British Journal of Industrial Relations* 45(2): 236-256.

Gibson, John, and David McKenzie. 2011. "The microeconomic determinants of emigration and return migration of the best and brightest: Evidence from the Pacific." *Journal of Development Economics* 95(1): 18-29.

Gunawardana, Pemasiri. 2006. "The Asian Currency Crisis and Australian Exports to East Asia." *Economic Analysis and Policy* 35(1-2): 73-90.

Harris, John R., and Michael P. Todaro. 1970. "Migration, Unemployment and Development: A Two-Sector Analysis." *The American Economic Review* 60(1): 126-142.

Jasso, Guillermina, and Mark R. Rosenzweig. 1982. "Estimating the Emigration Rates of Legal Immigrants Using Administrative and Survey Data: The 1971 Cohort of Immigrants to the United States." *Demography* 19(3): 279-290.

Kirdar, Murat G. 2013. "Source country characteristics and immigrants' optimal migration duration decision." *IZA Journal of Migration* 2(1): 1-21.

Makin, Tony. 1999. "The Asian Currency Crisis and the Australian Economy," *Economic Policy and Analysis* 29(1): 77-85.

Mesnard, Alice. 2004. "Temporary Migration and Capital Market Imperfections." *Oxford Economic Papers* 56(2): 242–262.

Nekoei, Arash. 2013. "Immigrants' Labor Supply and Exchange Rate Volatility." *American Economic Journal: Applied Economics* 5(4): 144-64.

Park, Yung Chul. 1996. "East Asian Liberalization, Bubbles, and the Challenge from China." *Brookings Papers on Economic Activity* 1996(2): 357-371.

Phillips, Janet, Michael Klapdor, and Joanne Simon-Davies. 2010. "Migration to Australia since federation: a guide to the statistics." *Background Note, Australia Parliamentary Library*. *http://aphnew.aph.gov.au/binaries/library/pubs/bn/sp/migrationpopulation.pdf*.

Piore, Michael J. 1979. *Birds of Passage: Migrant Labor and Industrial Societies*. New York: Cambridge University Press.

Radelet, Steven, and Jeffrey D. Sachs. 1998. "The East Asian Financial Crisis: Diagnosis, Remedies, Prospects." *Brookings Papers on Economic Activity* 28(1) 1-74.

Radelet, Steven, and Jeffrey Sachs. 1999. "What Have We Learned, So Far, From the Asian Financial Crisis?" CAER Discussion Paper No. 37.

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

Stark, Oded, Christian Helmenstein, and Yury Yegorov. 1997. "Migrants' Savings, Purchasing Power Parity, and the Optimal Duration of Migration." *International Tax and Public Finance* 4(3): 307-324.

United Nations Department of Economic and Social Affairs (Population Division). 2013 "The Number of International Migrants Worldwide Reaches 232 million." *http://esa.un.org/unmigration/documents/The_number_of_international_migrants.pdf* (accessed Jan. 31, 2015)

World Bank. "World Development Indicators." http://data.worldbank.org/data-catalog/world-development-indicators (accessed July 5, 2013).

World Bank, Development Prospects Group. 2014. "Migration and Remittances: Recent Developments and Outlook." *Migration and Development Brief*. http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1288990760745/MigrationandDevelopmentBrief23.pdf (accessed Jan. 31, 2015)

Yang, Dean. 2006. "Why Do Migrants Return to Poor Countries? Evidence from Philippine Migrants' Responses to Exchange Rate Shocks." *The Review of Economics and Statistics* 88(4): 715-735.

Queensland Treasury and Trade. *Annual Economic Report, 1997-1998* http://www.qgso.qld.gov.au/products/reports/annual-econ-report/annual-econ-report-1997-98.pdf (accessed June 21, 2013)
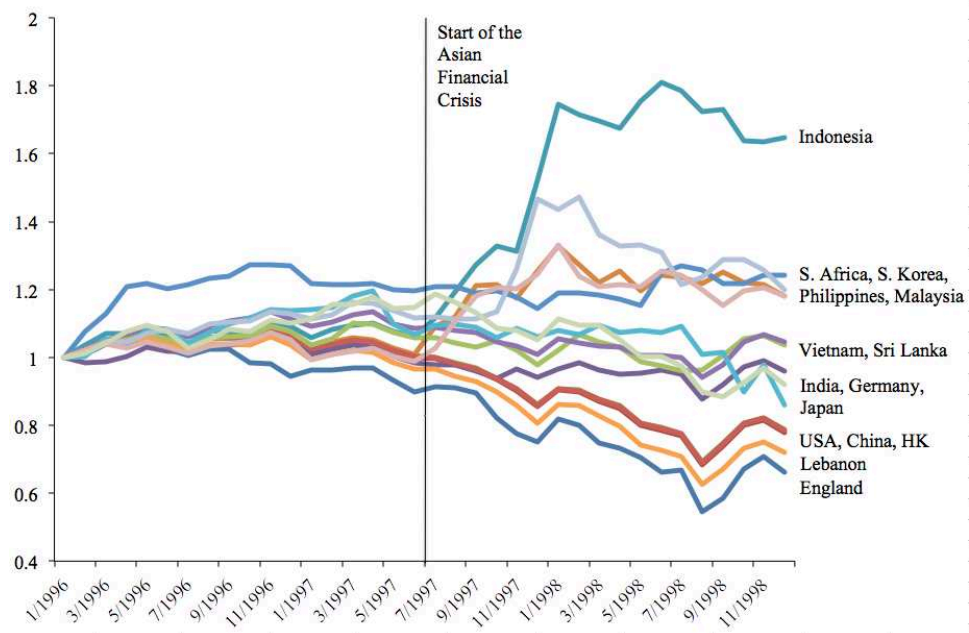
FIGURE 1. FOREIGN EXCHANGE RATES OF THE TOP 15 HOME COUNTRIES OF AUSTRALIAN IMMIGRANTS

Notes: Historical exchange rate data are from Oanda Corporation. The exchange rates are expressed in foreign currency over Australian dollar (e.g. PHP/AUD) and are normalized to 1 in January 1996.

TABLE 1—DESCRIPTIVE STATISTICS FOR THE SAMPLE OF IMMIGRANTS

Panel A: Immigrant Characteristics (N=3069)	Mean	St. Dev	Min	Max
Prop. Male	0.57			
Age	32.72	8.59	15	60
Married	0.72			
Highest Formal Qualification				
Higher Degree	0.12			
Post Graduate Diploma	0.06			
Bachelor's Degree	0.24			
Technical/Professional Qualification	0.23			
Trade	0.07			
12 or more years of schooling	0.13			
11 or fewer years of schooling	0.14			
Visa Classification				
Preferential Family	0.45			
Concessional Family	0.18			
Business Skills & Employer Nomination	0.13			
Independent	0.20			
Humanitarian	0.05			

Panel B: Household Characteristics (N=3069)	Mean	St. Dev	Min	Max
Household Size	3.53	1.85	1	14
Number of Household Members in Home Country				
0	0.60			
1	0.27			
2 or more	0.13			
AUD value of funds arrived with when first immigrated	26,332	94,439	0	1,100,000
Average weekly income[a]				
None	0.09			
$1 to $57 per week	0.05			
$58 to $96 per week	0.03			
$97 to $154 per week	0.10			
$155 to $230 per week	0.09			
$231 to $308 per week	0.07			
$309 to $385 per week	0.07			
$386 to $481 per week	0.10			
$482 to $577 per week	0.10			
$578 to $673 per week	0.07			
$674 to $769 per week	0.05			
$770 to $961 per week	0.07			
$962 or more per week	0.11			
Household Sent Money Overseas to Relatives/Friends	0.19			
Place of Residence				
New South Wales	0.43			
Victoria	0.23			
Queensland	0.11			
South Australia	0.05			
Western Australia	0.12			
Other	0.06			

Panel C: Other	Mean	St. Dev	Min	Max
Return Rate	0.04	0.20	0	1
Exchange Rate Shock	0.10	0.29	-0.29	3.10
GDP per capita (in USD, PPP)	$13,977	$11,353	$472	$67,170

[a] To minimize missing observations, I construct average weekly income by taking the maximum between the average weekly income of the primary applicant and the spouse. This is an imperfect measure of household income although all the following regressions are robust to using average income only of the principal applicant. Alternate measures that the LSIA provides include total household income or total weekly income from all sources but these contain many missing observations.

TABLE 2—THE TOP 15 SOURCE COUNTRIES WITH MEAN EXCHANGE RATE CHANGES EXPERIENCED

Origin country	N	percent of sample	percent cumulative	mean exchange rate change
England	281	9.16	9.16	-0.08
Hong Kong	187	6.09	15.25	-0.05
China (excluding Taiwan)	153	4.99	20.23	-0.07
India	145	4.72	24.94	0.08
Philippines	126	4.11	29.06	0.14
South Africa	121	3.94	33.01	0.18
United States of America	105	3.42	36.43	-0.04
Japan	78	2.54	38.97	0.16
Lebanon	78	2.54	41.51	-0.10
Malaysia	74	2.41	43.92	0.14
South Korea	73	2.38	46.30	0.24
Indonesia	72	2.35	48.65	0.72
Turkey	72	2.35	53.27	1.12
Germany	70	2.28	55.33	0.08
Thailand	63	2.05	57.25	0.20
Other	1371	44.67	100	0.08
Total	3069	100	100	0.10

TABLE 3—REASONS FOR SAMPLE ATTRITION

Reason	Description
Unable to Track	Address information not current or inadequate. Migrant was not contacted and current location unknown
Refused	Migrant refused interview.
Overseas Temporarily	Information given that migrant has left Australia for the scheduled interview period, but intends to return to Australia
Overseas Permanently	Information given that migrant has left Australia and does not intend to return.
Out of area	Migrant settled in area too distant from capital city to be economically viable to interview.
Other	Migrant too sick to interview, deceased, other reasons.

	(1)	(2)	(3)	(4)	(5)
ΔlnERATE	-0.0512***	-0.0380***	-0.0366***	-0.0389***	-0.0373***
	(0.0128)	(0.00948)	(0.0109)	(0.00988)	(0.0104)
ln(GDP per capita of origin country)		0.0172***	0.0161***	0.0139***	0.0155***
		(0.00321)	(0.00340)	(0.00396)	(0.00441)
Other Country of Origin controls	N	N	Y	Y	Y
Household controls	N	N	N	Y	Y
Individual Migrant controls	N	N	N	N	Y
N	3069	3069	3069	3069	3069
R^2	0.007	0.016	0.016	0.027	0.028

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be "overseas permanently" (assumed here to have returned to country of origin). Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, highest educational attainment, household size, marital status, type of visa upon admission, state of residence, average weekly income and Australian dollar value of funds arrived with when first immigrated.

Robust standard errors in parentheses, clustered at the country of origin level

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 5— THE EFFECTS OF EXCHANGE RATE SHOCKS BY INTENTION OF RETURN

	(1)	(2)	(3)
Intend to Return=NOT SURE	0.0555***	0.0502***	0.0501***
	(0.0104)	(0.0106)	(0.0103)
Intend to Return=YES	0.178***	0.172***	0.169***
	(0.0433)	(0.0429)	(0.0425)
ΔlnERATE	-0.0119	-0.0151	-0.0130
	(0.0106)	(0.00942)	(0.0157)
(ΔlnERATE)*(Intend to Return=NOT SURE)	-0.0625***	-0.0551***	-0.0568***
	(0.0172)	(0.0175)	(0.0184)
(ΔlnERATE)*(Intend to Return=YES)	-0.233***	-0.225***	-0.224***
	(0.0757)	(0.0747)	(0.0748)
Country of Origin controls	Y	Y	Y
Household controls	N	Y	Y
Individual Migrant controls	N	N	Y
N	3069	3069	3069
R^2	0.050	0.057	0.057

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be "overseas permanently" (assumed here to have returned to country of origin). Intend to Return is an indicator variable that captures the immigrant's response to the question in wave 2, "Do you intend to return to your home country?" Possible answers were: 'yes', 'no', and 'not sure.' Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, highest educational attainment, household size, marital status, type of visa upon admission, state of residence, average weekly income and Australian dollar value of funds arrived with when first immigrated.

Robust standard errors in parentheses, clustered at the country of origin level

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

	(1)	(2)	(3)	(4)	(5)	(6)
ΔlnERATE	-0.0483***			-0.0440***	-0.0469***	-0.0438***
	(0.0124)			(0.0114)	(0.0120)	(0.0115)
ΔlnGDPPCAPITA		0.175*		0.0928		0.0838
		(0.0995)		(0.0966)		(0.0896)
ΔUNEMPLOYMENT			-0.0024		-0.0013	-0.0005
			(0.0025)		(0.0024)	(0.0024)
Country of Origin controls	Y	Y	Y	Y	Y	Y
Household controls	Y	Y	Y	Y	Y	Y
Individual Migrant controls	Y	Y	Y	Y	Y	Y
N	2480	2480	2480	2480	2480	2480
R^2	0.037	0.036	0.032	0.037	0.033	0.033

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be "overseas permanently" (assumed here to have returned to country of origin). Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, education level, household size, marital status, type of visa upon admission, state of residence, average weekly income in the earlier wave and Australian dollar value of funds arrived with when first immigrated

Robust standard errors in parentheses, clustered at the country of origin level

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

	(1)	(2)	(3)
ΔlnERATE	-0.0393***		-0.0418
	(0.0103)		(0.0281)
ΔlnCPI		-0.0361***	0.00312
		(0.0116)	(0.0312)
Country of Origin controls	Y	Y	Y
Household controls	Y	Y	Y
Individual Migrant controls	Y	Y	Y
N	3080	3080	3080
R^2	0.032	0.031	0.031

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be "overseas permanently" (assumed here to have returned to country of origin). Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, education level, household size, marital status, type of visa upon admission, state of residence, average weekly income in the earlier wave and Australian dollar value of funds arrived with when first immigrated

Robust standard errors in parentheses, clustered at the country of origin level

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Panel A	Return from wave 1 – wave 2	Panel B	Return from wave 2 – wave 3
$\Delta \ln\text{ERATE}_{\text{wave2 –wave3}}$	-0.0057	$\Delta \ln\text{ERATE}_{\text{wave3 – 2yrs after}}$	-0.0139
	(0.0081)		(0.0128)
Country of Origin controls	Y	Country of Origin controls	Y
Household controls	Y	Household controls	Y
Individual Migrant Controls	Y	Individual Migrant controls	Y
N	3535	N	3069
R^2	0.005	R^2	0.025

Notes; For panel A, the dependent variable is a dummy variable indicating that the individual is reported to be "overseas permanently" for wave 2 (assumed here to have returned to country of origin). The exchange rate change is the change in the exchange rate from wave 2 to wave 3 of the survey. For panel B, the dependent variable is a dummy variable indicating that the individual is reported to be "overseas permanently" for wave 3 (assumed here to have returned to country of origin). The exchange rate change is the change in the exchange rate from wave 3 to two years after the survey. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, highest educational attainment, household size, marital status, type of visa upon admission, state of residence, average weekly income and Australian dollar value of funds arrived with when first immigrated.

Robust standard errors in parentheses, clustered at the country of origin level

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 9— ARE THE EFFECTS OF THE EXCHANGE RATE SHOCKS CONTEMPORANEOUS?

	(1)	(2)	(3)	(4)	(5)
ΔlnERATE	-0.0554[*]	-0.0557[*]	-0.0554[*]	-0.0565[*]	-0.0543[*]
	(0.0280)	(0.0284)	(0.0285)	(0.0284)	(0.0292)
ΔlnERATE$_{lag1}$		0.0070	0.0063		
		(0.0494)	(0.0499)		
ΔlnERATE$_{lag2}$			0.0057		
			(0.0239)		
ΔlnERATE$_{lag10yr}$				0.0029	
				(0.0031)	
ΔlnERATE$_{future}$					0.0104
					(0.0176)
Country of Origin controls	Y	Y	Y	Y	Y
Household controls	Y	Y	Y	Y	Y
Individual Migrant controls	Y	Y	Y	Y	Y
N	2596	2596	2596	2596	2596
R^2	0.024	0.024	0.024	0.024	0.024

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be "overseas permanently" (assumed here to have returned to country of origin). Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, highest educational attainment, household size, marital status, type of visa upon admission, state of residence, average weekly income and Australian dollar value of funds arrived with when first immigrated.

Robust standard errors in parentheses, clustered at the country of origin level

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 10— THE EFFECT OF EXCHANGE RATE SHOCKS ON PERMANENT RETURN MIGRATION FOR THE TRIMMED SAMPLE

	(1) Full sample	(2) w/o top 3 extreme	(3) w/o top 5 extreme	(4) trim 99th percentile	(5) trim 95th percentile	(6) trim 90th percentile
ΔlnERATE	-0.0373***	-0.0513**	-0.0518**	-0.0437***	-0.0842***	-0.104**
	(0.0104)	(0.0207)	(0.0231)	(0.0130)	(0.0272)	(0.0414)
Country of Origin controls	Y	Y	Y	Y	Y	Y
Household controls	Y	Y	Y	Y	Y	Y
Individual Migrant controls	Y	Y	Y	Y	Y	Y
N	3069	2963	2948	3036	2915	2768
R^2	0.028	0.027	0.027	0.028	0.028	0.027

Notes: The dependent variable is a dummy variable indicating that the individual is reported to be "overseas permanently" (assumed here to have returned to country of origin). Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, education level, household size, marital status, type of visa upon admission, state of residence, average weekly income in the earlier wave and Australian dollar value of funds arrived with when first immigrated

Robust standard errors in parentheses, clustered at the country of origin level

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 11— EXPECT TO EMIGRATE TO ANOTHER COUNTRY?

	Freq.	Percent
Yes	28	0.91
No	2699	87.94
Not Sure	213	6.94
[Expect to immigrate to former country]	129	4.20

TABLE 12— THE CORRELATION BETWEEN THE ATTRITION VARIABLE AND THE EXCHANGE RATE SHOCKS

	(1) Unable to Track	(2) Refused	(3) Overseas Temporarily	(4) Out of Scope	(5) Deceased	(6) Other
ΔlnERATE	0.0085	0.0054	-0.0117	0.0078*	-0.0009	0.0131
	(0.0131)	(0.0113)	(0.0170)	(0.0047)	(0.0006)	(0.0089)
Country of Origin controls	Y	Y	Y	Y	Y	Y
Household controls	Y	Y	Y	Y	Y	Y
Individual Migrant controls	Y	Y	Y	Y	Y	Y
N	3069	3069	3069	3069	3069	3069
R^2	0.022	0.002	0.013	0.000	0.007	0.007

Notes: Exchange rates are in terms of foreign currency per Australian dollar. Country of origin controls include indicators for common language and colonial relationship with Australia, the log distance from Australia, and an indicator for whether the country was one of the countries hardest hit by the Asian Financial Crisis. Household and immigrant controls include age, sex, education level, household size, marital status, type of visa upon admission, state of residence, average weekly income in the earlier wave and Australian dollar value of funds arrived with when first immigrated.

Robust standard errors in parentheses, clustered at the country of origin level

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.