

IZA DP No. 290

## **The Job Search and Education Investments of Immigrant Families**

Deborah A. Cobb-Clark  
Marie D. Connolly  
Christopher Worswick

April 2001

# The Job Search and Education Investments of Immigrant Families

**Deborah A. Cobb-Clark**

*SPEAR Centre, RSSS, Australian National University, Canberra and IZA, Bonn*

**Marie D. Connolly**

*Department of Business & Economics, Chatham College, Pittsburgh*

**Christopher Worswick**

*Department of Economics, Carleton University, Ottawa*

Discussion Paper No. 290

April 2001

IZA

P.O. Box 7240  
D-53072 Bonn  
Germany

Tel.: +49-228-3894-0  
Fax: +49-228-3894-210  
Email: [iza@iza.org](mailto:iza@iza.org)

This Discussion Paper is issued within the framework of IZA's research area *Mobility and Flexibility of Labor Markets*. Any opinions expressed here are those of the author(s) and not those of the institute. Research disseminated by IZA may include views on policy, but the institute itself takes no institutional policy positions.

The Institute for the Study of Labor (IZA) in Bonn is a local and virtual international research center and a place of communication between science, politics and business. IZA is an independent, nonprofit limited liability company (Gesellschaft mit beschränkter Haftung) supported by the Deutsche Post AG. The center is associated with the University of Bonn and offers a stimulating research environment through its research networks, research support, and visitors and doctoral programs. IZA engages in (i) original and internationally competitive research in all fields of labor economics, (ii) development of policy concepts, and (iii) dissemination of research results and concepts to the interested public. The current research program deals with (1) mobility and flexibility of labor markets, (2) internationalization of labor markets and European integration, (3) the welfare state and labor markets, (4) labor markets in transition, (5) the future of work, (6) project evaluation and (7) general labor economics.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character.

## **ABSTRACT**

### **The Job Search and Education Investments of Immigrant Families\***

This paper examines the post-migration investments in schooling and job search of immigrant families using new longitudinal data for Australia. Higher education levels at time of arrival are associated with a greater probability of enrolling in school after migration. In households where the visa category would suggest that post-migration investments may be important, we find higher rates of school enrollment and job search. Traditional gender roles appear to dictate which partner makes the investments in formal schooling. However, comparative labor market advantage, captured by principal applicant status appears to dictate which partner makes greater investments in job search.

JEL Classification: J61, J22, J60

Keywords: Immigrants, human capital investments, job search

Deborah Cobb-Clark  
Economics Program  
Research School of Social Sciences  
H C Coombs Bld  
The Australian National University  
Canberra ACT 0200  
Australia  
Tel.: +61 2 6125 3267  
Fax: +61 2 6257 1893  
Email: Dcclark@combs.anu.edu.au

---

\* The authors would like to thank Heather Antecol, Julian Betts, Thomas Crossley, Ted McDonald and Mark Regets for helpful suggestions. We would also like to thank seminar participants at the Australian National University, and participants at the 2000 Canadian Economics Association, the 2000 SOLE Meetings, the 2000 World Congress of the Econometric Society, the 2000 Vancouver Metropolis Conference, and the 2001 ASSA Meetings for useful suggestions.

## 1. Introduction

The nature of migration flows is becoming increasingly complex with more countries than ever being classified as major suppliers or receivers of international labor migrants (Stalker, 2000). It is not surprising then that understanding the process through which immigrants settle into the host country has become an important issue for researchers. Among the key questions are to what extent do immigrants' productive skills transfer to the new labor market and what is the process by which immigrants invest in host-country-specific skills? Answers to these questions are of special interest to policy makers establishing immigrant selection criteria. In particular, the extent to which immigrants selected on the basis of their skills find the transition into the labor market easier than immigrants selected on the basis of family relationships or out of humanitarian concerns depends critically on both skill transferability and subsequent human capital investment. If skilled immigrants are unable to transfer their skills or if family immigrants are able to 'catch up' through rapid investment, the divergence in labor market outcomes for these two groups will be reduced.

Although we know that migration is not always a solitary undertaking and that the 'migrating unit' often includes a husband, wife, and children, studies of post-migration human capital investment generally focus on the behavior of individual men (Chiswick, 1978; Borjas, 1982; Khan 1997; Chiswick and Miller, 1994; Duleep, *et al.*, 1999; Friedberg, 2000) and women (Chiswick and Miller, 1994; Duleep, *et al.*, 1999). The challenge to understanding the role of families in the settlement process, however, is that while labor force surveys and censuses may identify the foreign born, they provide only limited information about the migrating unit or the immigration process itself.<sup>1</sup> Principal applicants are usually indistinguishable from accompanying

---

<sup>1</sup> Researchers often do not know which individuals were married at the time of migration let alone whether they were married to their current spouse.

family members, and standard data sets identify family units at the time of data collection, not at the time of migration. Information about an immigrant's visa status is often lacking making it difficult to assess the role that selection criteria might play in the settlement process. Thus, many interesting questions remain unanswered. In particular, there is no research assessing post-migration human capital investment in a family context.<sup>2</sup> This is unfortunate as immigration policy typically results in the selection of families rather than individuals.<sup>3</sup>

Our goal is to analyze post-migration human capital investment—in particular, job search and enrollment in formal education—in immigrant families. To this end, we take advantage of a new data source that provides panel data for a recent cohort of immigrant households. The Longitudinal Survey of Immigrants to Australia (LSIA) provides a unique opportunity to simultaneously consider the behavior of men and women in the same migrating household. In particular we are interested in addressing the following questions: first, how does job search and enrollment in formal education vary across households entering Australia under different selection criteria and second, how are the investment decisions of family members related?

In the following section of the paper we briefly describe the Australian immigration program. Following that, the existing literature on the post-migration human capital investments of immigrants is reviewed. An overview of the LSIA data is presented in Section 4, while Section 5 briefly describes our theoretical framework. A discussion of the estimation procedure and

---

<sup>2</sup> See Borjas (1991), Duleep and Sanders (1993), Worswick (1996), Baker and Benjamin (1997) and Worswick (1999) for research that focuses explicitly the labor market adjustment of immigrant families.

<sup>3</sup> In many countries, once an individual principal applicant applies for and is granted a visa, dependent family members automatically receive visas as well.

empirical results follows in Section 6. Section 7 investigates the relationship in the investment behavior of family members. The final section of the paper discusses some general conclusions and provides suggestions for future research.

## **2. Immigration to Australia**

Australia shares a common history with Canada and the United States as a major immigrant-receiving nation. Nearly six million people have migrated to Australia since the start of the post-war migration program in October of 1945. Although Australia's annual immigrant intake is small relative to that of Canada and the United States, the size of its foreign-born population attests to its importance as a major immigrant nation. In 1996, first-generation immigrants made up 23.0 percent of Australia's population and an additional 18.6 percent of the population had a least one foreign-born parent (DIMA, 1998). In contrast, 17.4 percent of the Canadian and 9.3 percent of the U.S. population is foreign born (OECD 1995).<sup>4</sup>

As in Canada and the United States, immigrants to Australia are selected into three major streams—skilled-based, family-based, and humanitarian. Although family reunification is important in Australia, recent years have seen policy makers giving equal weight to skilled immigrants. Australia's skilled immigration program is modeled closely on Canada's and with minor exceptions, the policies of the two countries are broadly the same (Clarke, 1994). In contrast, U.S. immigration policy continues to stress family reunification (see Table 1). Questions have been raised in the United States, however, about the relationship between family reunification and the quality of immigrants (Borjas, 1992). As skilled labor shortages intensify in the United States there have been renewed calls to increase the number of skill-based visas.

---

<sup>4</sup> Net overseas migration accounts for approximately half of Australia's population growth (DIMA, 1998).

### **See Table 1**

Australia has also been at the forefront of another major trend in international migration—the dramatic increase in Asian immigration. Asia is presently one of the largest sending regions for migrants and refugees (OECD, 1995). In Australia, the Asian-born population increased from 6.5 percent of the foreign-born population in 1971 to 21.9 percent in 1991. Over the same time period, Asians increased from 3.6 to 24.5 percent of the foreign born population in Canada and from 8.6 to 25.2 percent of the foreign born population in the United States. This increase in Asian immigration has been offset by an overall decline in immigration from Europe.

The increased desire for skilled workers and the movement away from traditional European sending countries imply that the post-migration human capital investments of immigrants are becoming increasingly important. In particular, an inability to speak English is often a major obstacle to labor market success (Chiswick and Miller, 1995; Duleep and Sanders, 1993) and educational qualifications seem to be less transferable the more dissimilar the origin and destination countries (Khan, 1997). The successful integration of immigrants into the labor market depends critically on the investment behavior of immigrants themselves.

### **3. Human Capital Investment and Immigrant Adjustment**

Chiswick (1978, 1979) was among the first to argue that if immigrants are unable to completely transfer their human capital to the new labor market the opportunity cost of human capital investments will be lower for them than for natives. At the same time, acquiring host-country-specific skills may also increase the transferability of skills acquired before migration, thereby increasing the returns to post-migration human capital investment (Chiswick and Miller,

1994; Kahn, 1997; Duleep and Regets, 1999; Friedberg, 2000). Immigrants will thus invest more and consequently have more rapid wage growth than natives.<sup>5</sup>

Empirical work documents the importance of immigrants' human capital investments. Not surprisingly investments are more common earlier in the settlement process (Chiswick, 1978) and among younger immigrants (Chiswick and Miller, 1994; Khan, 1997). Human capital investments appear to be more likely among immigrant groups that cannot easily or are unlikely to return home (Borjas, 1982; Chiswick and Miller, 1994; Duleep, et al., 1999). Women who are tied-movers are less likely to invest than men (Chiswick and Miller, 1994). As the theory predicts, there is empirical evidence that more post-migration investment takes place when skills are less transferable either because of differences in English language background (Khan, 1997; Duleep *et al.*, 1999) or because immigrants themselves were not specifically selected on skills (Duleep and Regets, 1999).<sup>6</sup> Finally, the evidence on the relationship between the level—as opposed to the transferability—of pre-migration human capital and post-migration investment is inconclusive with some researchers finding a positive relationship (Chiswick and Miller, 1994) and others finding a negative or mixed relationship (Borjas, 1982; Khan, 1997).

It is important to note that human capital investment is not solely about acquiring language skills or formal education, but also includes the process of job search which may differ for

---

<sup>5</sup> It is this extra wage growth which economists have come to label “assimilation” (see for example, Chiswick, 1978; Borjas, 1985). See Borjas (1985) and LaLonde and Topel (1991) for a discussion of the methodological issues involved in estimating the magnitude of the assimilation effect.

<sup>6</sup> Note, however, that this is not a universal finding. Chiswick and Miller (1994) examine immigrants to Australia and find that Asian refugees are the least likely to invest in human capital.



immigrants.<sup>7</sup> Specifically, the costs associated with job search are likely to be related to both the level and transferability of an immigrant's human capital. The efficiency of job search also depends on knowledge—which may be gained differentially over time—about destination institutions and work environment. Finally, reservation wages may vary across immigrant groups (Beggs and Chapman, 1990; and Daneshvary et al., 1992).<sup>8</sup>

The individual is the unit of analysis in all the aforementioned studies. Yet interrelationships in the behavior of family members will be especially important if credit constraints lead immigrant families to finance any post-migration human capital investment themselves. A family investment strategy would result in specialization among family members with some investing in host-country-specific human capital and others undertaking labor market activities to finance that investment (Long, 1980; Beach and Worswick, 1993; Duleep and Sanders 1993; Worswick, 1996; and Baker and Benjamin, 1997). In this case, studies that focus only on individual immigrants paint an incomplete picture of the investment process.

#### **4. The Longitudinal Survey of Immigrants to Australia**

The Longitudinal Survey of Immigrants to Australia (LSIA) provides a unique opportunity to follow a cohort of recent principal applicants and their spouses as they enter the Australian labor market and begin looking for work. The LSIA sample generalizes to principal applicants aged 15

---

<sup>7</sup> See Chiswick and Miller (1998) for a recent review of the literature assessing the language acquisition of recent immigrants and Chiswick and Miller (1995) for a study of the relationship between language acquisition and earnings in Australia, Canada, and the United States.

<sup>8</sup> Several studies have examined the determinants of immigrant unemployment see (Miller, 1986; Inglis and Stromback, 1986; Chiswick *et al.* 1997) for reviews of this literature.

and older who arrived in Australia between September 1993 and August 1995. A total of 5192 principal applicants in this migration cohort were interviewed starting in March of 1994 approximately five to six months after their arrival. Starting in March of 1995 (approximately 18 months after arrival), 4469 members of the original sample were re-interviewed. Finally, 3752 of these principal applicants were re-interviewed for a third time approximately three and a half years after migration. Our estimation sample consists of the 1489 Wave 1, 1408 Wave 2, and 1192 Wave 3 principal applicants with spouses who were also interviewed.<sup>9</sup>

As the LSIA data do not contain information about native-born workers, it is not possible to assess how immigrant status itself matters for human capital investment. Rather, we exploit variation across immigrant families—in particular variation across visa categories and region of origin—to make inferences about skill transferability and the potential return to investing in Australia-specific human capital.<sup>10</sup> Skill-based principal applicants are expected to invest less in Australia-specific human capital after migration. What is unclear is the extent to which this also applies to dependent spouses who are not subject to any admissions criteria.

Non-humanitarian immigration to Australia is separated into two components: one based strictly on family relationships (Preferential Family) and the other based on potential labor market contributions. As immigrants in the Preferential Family category are often migrating as individuals to reunite with family members (usually future spouses) already resident in Australia, we have

---

<sup>9</sup> In each wave more than 95 percent of eligible spouses were separately interviewed. We have restricted the sample to those couples in which both the husband and wife were between the ages of 19 and 60 in Wave 1.

<sup>10</sup> See Duleep and Regets (1999) who also argue that admissions criteria and ethnic background are two ways of dividing immigrants according to skill transferability.

excluded these individuals from our analysis of migrating households.<sup>11</sup> Skill-based migration includes immigrants without family relationships who are points tested (Independents), immigrants intending to establish businesses in Australia who meet certain capital requirements (Business Skills(BS)), and immigrants with pre-arranged offers of employment (Employer Nomination Scheme (ENS)).<sup>12</sup> ENS immigrants are granted visas because their specific skills allow Australian employers to fill a particular skill gap, and as a result we would expect them to have little need to invest in additional Australia-specific human capital. The Concessional Family program assesses individuals on the basis of both their family connections and their skills. Finally, a number of immigrants are granted entry for humanitarian reasons.<sup>13</sup> Humanitarian immigrants often have very limited skills and are expected to make relatively large post-migration human capital investments.

---

<sup>11</sup> Unfortunately, our data do not provide detailed information about family members who are not part of the migrating unit and so Preferential Family immigrants joining family members already in Australia cannot be analyzed. The small sample of Preferential Family immigrants migrating as couples are not representative of the category as a whole and have thus been dropped from the analysis.

<sup>12</sup> Due to small sample sizes and the similarity in admission criteria, BS and ENS immigrants are combined.

<sup>13</sup> Information about visa status comes from Department of Immigration and Multicultural Affairs administrative records not self-reports.

## 5. Theoretical Model and Econometric Specification

In this section, we outline a model of household labor supply and investment in human capital in immigrant families. The first order conditions are generated and then used to guide our choice of estimation equations and the interpretation of the reduced form results. We have chosen not to pursue structural estimation because it would be difficult to generate wage rates in our data due to the low employment rates of certain groups in the first years after migration. Consequently, our objective is to generate a parsimonious theoretical framework that allows the pertinent issues to be illustrated while maintaining simplicity.

Immigrant households are assumed to maximize lifetime household expected utility by choosing consumption and the time use of each of the two adult household members in each period. Each individual's time is allocated in each period between: 1) working for wages, 2) investments in human capital and 3) leisure which can be thought of as including various forms of home production.<sup>14</sup> The household's choices are constrained by a lifetime budget constraint and may be affected by the presence of credit constraints.

---

<sup>14</sup> See Worswick (1999) for estimation of a structural model of household labor supply in immigrant married couples in the absence of human capital investment. In that model, the household chooses consumption and hours of work for each spouse so as to maximize household expected lifetime utility. Duleep and Regets (1999) present a model of an individual's decision over whether to spend time in human capital acquisition or to work for wages where the objective is to maximize income. The model presented here combines the attractive features of both models in that the assumption of utility maximization is used (rather than income maximization) and the model allows for endogenous human capital accumulation (rather than exogenous wages). Additionally, the model employed in this paper allows for time to be allocated to leisure (or home

The household maximizes an additively-separable, lifetime, expected utility function where the within-period utility function is assumed to be concave and takes the form,  $U(t)=U(C(t), L_1(t), L_2(t))$ ; where  $a = 1, 2$  indexes adults,  $t = 1 \dots N$  indexes time periods,  $C(t)$  is family consumption,  $L_a(t) \equiv T - H_{aw}(t) - H_{ae}(t)$  is the hours of leisure of adult  $a$ ,  $T$  is the total number of hours in the period,  $H_{aw}(t)$  is the hours of paid work, and  $H_{ae}(t)$  is the hours spent in human capital investment by person  $a$  in period  $t$ .<sup>15</sup>

Hourly wage rates are determined in part by an individual's existing human capital stock. Individuals can accumulate human capital by devoting time to human capital investment activities.<sup>16</sup> Each individual's level of human capital can then be expressed as:

$$k_a(t) = k_a(t-1) + f[H_{ae}(t), (1-\tau)k_a(0)] \quad (1)$$

where  $k_a(t)$  is the human capital of spouse  $a$  in period  $t$ ,  $f[H_{ae}(t), (1-\tau)k_a(0)]$  is the increase in person  $a$ 's human capital due to the time spent in human capital investment. It is assumed that  $f[\cdot]$  is increasing in each of its arguments and that it is concave. The second argument of the function  $f[\cdot]$ , is intended to capture the effect of post-migration investments in human capital on the

---

production) unlike in the previous models of immigrant post-migration investments in human capital where the immigrant is assumed to allocate time to either paid employment or schooling.

<sup>15</sup> The empirical work analyzes both schooling and job search behavior. In terms of the theoretical model, we think of both of these activities as investments in human capital – the former involves formal schooling, the latter involves learning about job opportunities in the new labor market. An alternative approach would be to use a job search framework. For simplicity, we do not incorporate this into the model.

<sup>16</sup> The model could be extended to include endogenous returns to time in paid employment. See Shaw (1989) for a model of this kind.

transferability of human capital acquired in the source country. The human capital value  $k_a(0)$  is the amount of human capital acquired by the immigrant prior to migration and since some of it is specific to the source country labor market, only a fraction,  $\tau k_a(0)$ , of the human capital can initially be transferred into human capital that is valued in the new country. However, many researchers have argued, the acquisition of some new country specific skills (such as ability in the local language) can allow for the recovery of the human capital that did not originally transfer to the new labour market at the time of migration (Chiswick and Miller, 1994; Kahn, 1997; Duleep and Regets, 1999; Friedberg, 2000). The second term in  $f[\cdot]$  is the amount of human capital that the immigrant possessed at the time of migration that was not transferable. So that time spent in investment will have a large pay-off in terms of increased human capital if there was a lot of human capital that could not initially be transferred to the new country. Overall then, post-migration human capital accumulation leads to an increase in the immigrants' human capital because: 1) it adds directly to the stock of valuable skills and 2) it allows for the recovery of human capital that did not initially transfer to the new country's labour market.

The following necessary condition for utility maximization, with respect to time in investment activities, can be derived:

$$-U_{L_a}(t) + \psi_a(t)f_{He}(t, a) - \lambda(t)p_e(t) + \gamma_{ea}(t) = 0 \quad (2)$$

where  $U_x(t)$  is the derivative of  $U(t)$  with respect to  $x$ ;  $\psi_a(t)$  is the multiplier on the human capital accumulation equation (1);  $\lambda(t)$  is the multiplier for the period  $t$  asset accumulation constraint;  $p_e(t)$  is the tuition cost; and  $\gamma_{ea}(t)$  is the multiplier on the non-negativity constraint for the hours in investment activities of each individual.<sup>17</sup>

---

<sup>17</sup> Similar conditions can be derived for consumption and hours of paid work:

$$U_c(t) - \lambda(t)p(t) = 0$$

Equation (2) captures the household's decision over whether adult  $a$  invests time in human capital accumulation in period  $t$ . If the final term on the left-hand-side of the equation is zero then the benefits to the adult investing in human capital exceed the costs and investment occurs. The individual will devote time to human capital accumulation if the costs of the investment in terms of the foregone leisure costs,  $-U_{L_a}(t)$ , and the tuition costs,  $-\lambda(t)p_e(t)$ , do not exceed the future benefit from the human capital accumulated,  $\psi_a(t)f_{He}(t, a)$ .

Our empirical approach is to estimate reduced form models of human capital investment behavior of principal applicants and spouses that can be thought of as being derived from (2). Following the literature on human capital investments of immigrants, we focus only on the decision whether to invest in human capital.<sup>18</sup>

The following reduced form model is employed in the estimation:

$$Y_{it} = Z_i \alpha + \sum_{j=1}^3 \alpha_{1j} Visa_{ji} + \sum_{k=1}^4 \alpha_{2k} Cntry_{ki} + \alpha_i + X_{it} \beta_1 + \beta_2 YSM_{it} + \beta_3 YSM_{it}^2 + \sum_{j=1}^3 \beta_{4j} Visa_{ji} \times YSM_{it} + \varepsilon_{it} \quad (3)$$

---


$$-U_{L_a}(t) + \lambda(t)w(t)(k_a(t-1)) + \gamma_{wa}(t) = 0$$

where  $p(t)$  is the price of the consumption good;  $w(t)$  is the wage rate; and  $\gamma_{wa}(t)$  is the multiplier on the period  $t$  non-negativity constraint for the hours in paid work of person  $a$ .

<sup>18</sup> We do not explicitly account for this relationship between the decision to work for wages and the decision to invest in human capital. However, exploring this relationship between the decision to work for wages and the decision to invest in human capital accumulation is an important area for future research.

where  $i$  indexes adults and the dependent variable  $Y_{it}$  is either: 1) a dummy variable for school enrollment, 2) a continuous variable for the proportion of time spent unemployed since the last survey or 3) a dummy variable for searching for work while employed.<sup>19</sup>

The first line of equation (3) contains variables such as visa category that do not vary with time.<sup>20</sup> We expect that the extent to which individual immigrants are able to transfer their existing skills into the Australian labor market will be correlated with their visa category. Additionally, immigrants not specifically selected on skills or who come from non-English speaking backgrounds are likely to have more difficulty in transferring their human capital than other immigrants. The second line of equation (3) includes time-varying variables such as years since migration (YSM) and its interaction with visa category. Furthermore, the vector  $X_{it}$  contains time-varying controls for State-level unemployment rates, measures of English ability for both the principal applicant and spouse, dummy variables for the presence of children in different age groups and for the presence of other adults in the household.

The  $\alpha_i$  's are individual fixed effects that capture differences in wealth across households. These differences will have an impact on the household's desire for family members to spend time in investment activities rather than in leisure and would appear in (2) in terms of a fixed

---

<sup>19</sup> Each of these parts of the estimation is carried out separately. In doing this, we are ignoring the possible simultaneity of these choices. This is an important area for future research.

<sup>20</sup> Immigrants from English-speaking backgrounds include individuals from the United Kingdom, Ireland, Canada, New Zealand, South Africa and the United States. This is the reference group in the analysis. Individuals from non-English-speaking backgrounds have been divided into four groups as follows: 1) Asia, 2) Northern and Western Europe, 3) Southern and Eastern Europe, and 4) other countries including Africa and Central and South America.



component of the marginal utility of income term,  $\lambda(t)$ .<sup>21</sup> These effects will also capture heterogeneity in unobserved individual characteristics like aptitude for each of the investment activities. For example, more intelligent individuals may be more likely to succeed in formal education and this would make them more likely to be enrolled in an education program. This would appear in (2) as a large, positive, fixed component in the function  $f_e'(t,a)$ . Another possibility is that the fixed effects may represent a high marginal utility to leisure in all periods,  $U_{La}(t)$ . This could represent person-specific differences in preferences in attitudes towards work. Alternatively, the same type of effect could represent differences in supply of time to paid employment on the investment decisions. Given that marginal utility of leisure is assumed to be decreasing in leisure the total amount of leisure consumed in all periods will partly be determined by the number of hours a person works in paid employment. If leisure is low because of a large amount of time being devoted to paid employment, time being devoted to schooling would be expected to be lower.

A fixed effects linear probability model is used in the first stage of the estimation.<sup>22</sup> Although the linear probability model is less than ideal as a model for discrete choice problems (as

---

<sup>21</sup> For example, MaCurdy (1981) treats this as a fixed effect in a model with perfect capital markets. In models with credit constraints,  $\lambda(t)$  will in general be decreasing with time as the household moves from a period of being unable to borrow into the future. See Worswick (1999) for a formal presentation of this.

<sup>22</sup> All estimation was done using STATA 6.0. For the unemployment analysis, the same estimation strategy is used, although the dependent variable is not discrete but rather is continuous over the zero to one range.

we have here)<sup>23</sup>, there are two reasons which lead us to prefer the linear probability model for the problem at hand.<sup>24</sup> First, we would like to use the panel nature of the data to control for unobserved individual heterogeneity. Second, we would like to be able to recover the residuals from the first stage estimation so that we may explore the relationship between the investment behavior of principal applicants and their spouses. All of the variables that do not vary with time (the first line of equation (3)) will fall into the residuals of the fixed effects estimation. The linear probability model provides a straightforward way of accomplishing both of these objectives.<sup>25</sup>

Our estimation strategy involves two stages. In the first stage, a fixed-effects regression model is estimated giving us consistent estimates of the coefficients on the time-varying regressors of (3). In particular, since the YSM variables vary across the different waves of the panel, the

---

<sup>23</sup> In particular, ordinary least squares is inefficient because the disturbances are heteroscedastic. A more major problem is that predicted probabilities cannot be constrained to lie within the 0 – 1 interval (Greene, 1997).

<sup>24</sup> In spite of its limitations, the linear probability model is used in the literature. See, for example, Caudill (1988), Heckman and MaCurdy (1985), and Macleod and Parent (1999).

<sup>25</sup> We have strong theoretical reasons to believe that the individual effects are correlated with some of our dependent variables, in particular visa category. Thus, random effects probit models are inappropriate. Although conditional logit models would not require the individual effects and the independent variables to be uncorrelated, they also would not allow us to recover the residuals (Greene, 1997) which in our case are directly of interest and allow for the second stage estimation. Nonetheless, we have also estimated the determinants of these models using a conditional logit model and found the results in terms of the effects of the time-varying regressors to be qualitatively equivalent to those presented here. These results are available upon request.

coefficients on these variables can be estimated in the first stage. Following Polachek and Kim (1994), the second stage of the estimation involves regressing the residuals from the first stage estimation on the set of non-time-varying regressors in (3). These variables fall into the fixed effects of the first stage estimation and they therefore, appear in the residuals from the first stage. The second stage is estimated over the first observation of each household in the sample. This avoids the problem of having correlation across observations due to the unobserved heterogeneity. It should be noted that if the  $\alpha_i$ 's are correlated with the non-time-varying regressors in (3) then the second stage estimates of these coefficients will reflect in part the effects of the unobserved heterogeneity. For example, the effects of different visa categories on behavior will reflect in part the differences in unobserved ability that are present across households admitted under different admission criteria.<sup>26</sup>

## **6. The Timing and Level of Post-Migration Human Capital Investments**

All of the principal applicants in our sample (with the exception of Humanitarian immigrants) are selected to varying degrees for their labor market skills while no selection criteria are applied to spouses. Although conceptually immigrant spouses can be husbands as well as wives, previous researchers have not had the ability to identify principal applicant/spouse status separately from gender. Instead, immigrant husbands have been assumed to be primary workers making human capital investments, while immigrant wives have been assumed to be secondary workers financing their husbands' investments (Long, 1980; Baker and Benjamin, 1997; Duleep

---

<sup>26</sup>As Polachek and Kim point out, we would need instruments to separately identify the effects of unobserved heterogeneity from the effects of non-time-varying characteristics. Such instruments are difficult to find and we do not believe that they are available in our data.

and Sanders, 1993; Worswick, 1999). In contrast, we use detailed information about the immigration process to separate “traditional” (male principal applicant/female spouse) and “non-traditional” (female principal applicant/male spouses) households. Additionally, information about the selection criteria embodied in different migration programs is used to draw inferences about which immigrants are most likely to benefit from additional investment.

We consider three measures of human capital investment—formal education as well as employed and unemployed job search. Selected coefficients from our two-step estimation procedure are reported in Tables 2 - 4. For ease of discussion, the results appear in reverse order. Second-stage estimation results—in which first-stage residuals are regressed on time-invariant characteristics—appear in panel I of each table. These results tell us about the relationship at arrival between the level of human capital investment and characteristics such as own and partner’s education, visa status, and region of origin. The first-stage fixed effects regression results—which show how investment patterns change with years of Australian residence—appear in panel II.

### ***School Enrollment:***

An immigrant’s decision to enroll in formal education after migration is not related to his/her partner’s education levels (See Table 2.). School enrollment rates are also unrelated to one’s own education level in our small sample of non-traditional households. However, there is a relationship between own education and subsequent enrollment in schooling for those living in traditional households. Male principal applicants with less than a high school diploma or with a

high school/trade diploma are less likely to be enrolled in school than those who had already earned a university degree prior to migration. A similar pattern is observed for their female partners.<sup>27</sup>

### **Table 2 Here**

Visa category is also generally unrelated to the investments that immigrant women (both spouses and principal applicants) make in formal education immediately after migration. On the other hand, visa category is strongly related to the level of educational investments among immigrant men at the time of landing in Australia. Not surprisingly, male ENS/BS immigrants have lower estimated enrollment probabilities than immigrant men admitted under other visa categories. These immigrants, after all, have jobs—either through Australian firms or through self-employment—lined up prior to actual migration. What is surprising is the high proportion of Independent immigrant men who are enrolled in education soon after migration. These men (Independent principal applicants) who are selected entirely on the basis of their labor market skills are more likely to be making investments in formal education than are similar ENS/BS immigrants. School enrollment rates among male Independent principal applicants are also much higher than among otherwise similar male immigrants selected only in part (Concessional) or not at all (Humanitarian) for their skills. If skills acquired abroad are not perfectly transferable to the Australian labor market, Independent immigrants may need to invest in Australian schooling to maintain their occupational status. It is also interesting to note that large differences in enrollment rates by visa category are also observed for male spouses who are not required to meet any

---

<sup>27</sup>Previous findings on the relationship between post-migration schooling and pre-migration education have been inconclusive (Chiswick and Miller, 1994; Borjas, 1982; Kahn, 1997) and our results are most consistent with Friedberg (2000) who finds that primary education is most portable.

particular selection criteria. Therefore, it appears that investments in formal education are made along gender lines with husbands in both traditional and non-traditional households most likely to be enrolled.

Variation in the school enrollment rate across regions of origin is generally consistent with our notions of skill transferability. Immigrants from countries that are less similar to Australia—Asia, Southern and Eastern Europe and elsewhere (primarily non-English speaking Africa and Latin America)—are at least as likely to be enrolled in school than are immigrants from English-speaking backgrounds. This is consistent with Duleep and Reget’s (1999) finding that there is greater human capital investment among immigrants from less developed countries.

The results from panel II in Table 2 allow us to consider how investment behavior varies across visa categories with duration of residence in Australia. The school enrollment rates of immigrants to Australia, increase over the first few years after migration, and then begin to decline. In general, these patterns do not vary significantly among principal applicants admitted to Australia under different selection criteria.<sup>28</sup>

In Figure 1, differences in school enrollment rates by visa category are highlighted. Coefficient estimates from Table 2 were used to predict differences in the probability of school enrollment between immigrants in a particular visa category and ENS/BS immigrants (the reference group) by years-since-migration. The top two panels present these graphs for traditional

---

<sup>28</sup> We tested for the significance of interactions of the YSM variable with the visa category variables and found them to be jointly insignificant in each of the estimations of columns (1), (3) and (4). The p-values for each of the tests are listed in the tables. We also explored specifications that interacted country of origin variables with the YSM variables in all of the models of Tables 2 through (4) and found that these interactions were uniformly not significant.

households where the left panel is for the male principal applicant and the right panel is for the female spouse. The equivalent graphs are presented below for households where the wife is the principal applicant. In traditional households, male principal applicants appear to be making investments in formal education, and this is especially true for Independent migrants. There is little variation in the enrollment rates of spouse in difference categories, however. A more complicated relationship appears in the non-traditional households. Male spouses in Concessional Family, Independent, and Humanitarian households are more likely to be enrolled in school than are male spouses holding ENS/BS visas. While there appears to be some evidence that the same could be said for their partners (female principal applicants); it should be noted that these differences across visa categories are not significant.

### **Figure 1**

#### ***Job Search While Unemployed***

Irrespective of current labor market status, all LSIA immigrants were asked about the number of months they had spent unemployed and looking for work. This information is used to construct a continuous measure of the proportion of time spent unemployed since the previous interview.<sup>29</sup> Selected coefficients from our two-step estimation model of unemployed job search are presented Table 3 and graphically depicted in Figure 2.

### **Table 3 and Figure 2 here**

---

<sup>29</sup> For Wave 1 this measure reflects the proportion of time unemployed since migration.

Our results suggest that there is little relationship between own or partner's education level and post-migration human capital investment in the form of unemployed job search.<sup>30</sup> Levels of unemployed job search are strongly related to visa category, however. Humanitarian immigrants (both spouses and principal applicants) spend a higher proportion of their time unemployed and searching for work immediately after arrival than do the ENS/BS default group; although unemployed job search is also relatively high for Independent and Concessional Family principal applicants. In one sense this is not surprising, since ENS/BS principal applicants arrive in Australia with prearranged employment or the intention of (and capital for) starting their own business. At the same time, differences in unemployment are not particularly large between Independent and Concessional Family immigrants which is consistent with the notion that whatever Concessional Family immigrants might lack in skills they make up for with family connections (Duleep and Regets, 1999).

Levels of unemployed job search also vary significantly across regions of origin. In general, immigrants from non-English speaking backgrounds spend more time unemployed than do immigrants from English-speaking countries. This is consistent with an earlier study that found the greater job search cost of non-English speaking migrants must outweigh the presumed higher reservation wages of English-speaking migrants (Beggs and Chapman 1990). To the extent that skill transferability varies across visa categories and regions of origin these results are consistent with previous evidence that post-migration human capital investment is higher among immigrants

---

<sup>30</sup> This is consistent with previous evidence that although additional pre-migration schooling decreases post-migration unemployment probabilities (Beggs and Chapman, 1990) the effect appears to be quite small (Miller, 1986).



whose existing skills are less transferable (Khan, 1997; Duleep *et al.*, 1999; Duleep and Regets, 1999).

Next we turn to the results from the first-stage, fixed effects estimation (in panel II of Table 3) to explore how patterns of unemployment across visa categories vary with duration of residence in Australia. The proportion of time spent unemployed decreases (at least initially) with time since migration for principal applicants and their spouses in both traditional and non-traditional households. This almost certainly occurs as a result of increases in human capital and labor market information that serve to move immigrants into employment.<sup>31</sup> Rates of employment assimilation vary significantly across principal applicants in different visa categories, however, with unemployed job search falling fastest among Independents who are selected solely on the basis of labor market skills, but who do not have pre-arranged employment prior to migration. Unemployed job search also declines significantly faster among male and female principal applicants holding Concessional Family visas and among male Humanitarian immigrants compared with the default ENS/BS immigrants. Thus, although ENS/BS immigrants initially have a head start in securing employment, they may not have permanently lower unemployment profiles.

This can be seen in Figure 2. By the fourth year in Australia, the models predict that Concessional Family and Independent male and female principal applicants have spent the same proportion of time spent unemployed as ENS/BS principal applicants. The patterns in Figure 2 also indicate that the Independent, Concessional Family and Humanitarian principal applicants also

---

<sup>31</sup> Alternatively, immigrants who are unsuccessful in securing employment may become discouraged and abandon their job search. This is unlikely to be a major factor in the above trends, however, because labor force participation increases steadily with years since migration for all immigrant groups.

spend the most time in unemployment just after arrival. The spouses in these families also have higher unemployment than do their counterparts in the default group; however, the differences are smaller than those for the principal applicants (with the possible exception of the Humanitarian male spouses).

### ***Employed Job Search***

Job search among immigrants does not necessarily end with employment. Employed LSIA immigrants are coded as engaging in job search if they reported that they were currently looking for either a new or a second job. Selected coefficients from our two-stage estimation procedure are presented in Table 4 and graphically depicted in Figure 3.<sup>32</sup>

#### **Table 4 and Figure 3 here**

As was the case with unemployed job search, the level of existing human capital is in general not significantly related to the probability that an employed immigrant will be searching for new work. Irrespective of gender, principal applicants and spouses in all visa categories are generally more likely to undertake employed job search shortly after arrival than are their ENS/BS counterparts who arrive in Australia with prearranged employment. Job search for male principal applicants is not sensitive to region of origin, but wives from Asia, Southern and Eastern Europe, and other regions are more likely to engage in employed job search than are wives from English-speaking backgrounds.

In panel II, we see selected coefficient estimates from the first stage, fixed effects linear probability model estimation. The YSM terms are not individually significant in any of the four

---

<sup>32</sup> Conditional logit estimates of the determinants of employed job search are substantially the same and are available upon request.

models. The interactions of the YSM variable with the visa variables can be rejected at the ten percent level in columns (2)-(4). For male principal applicants, these visa/YSM interactions are significant at the one percent level.

In Figure 3, the predicted difference in employed job search rates are presented by Visa category, YSM and gender of the principal applicant. The profiles are similar to those of Figure 2, especially if one restricts the focus to the Concessional Family and Independent immigrant families. It appears that it is the principal applicant (rather than the spouse) who makes the investment of time in job search while employed.

## **7. Conclusions**

This paper analyzes the post-migration human capital investments — in particular, job search and enrollment in formal education — of immigrant families. The Longitudinal Survey of Immigrants to Australia provides us with a unique opportunity to simultaneously consider the investment behavior of husbands and wives in the same migrating households. Our focus is on the extent to which the level and timing of post-migration investments vary with the transferability and level of pre-migration human capital. To this end, we exploit variation across immigrant families—in particular variation across visa categories and regions of origin—to make inferences about skill transferability and the potential return to investing in Australia-specific human capital. Previous researchers studying immigrant families have assumed that immigrant husbands are primary workers undertaking investment activities while immigrant wives are secondary workers undertaking financing activities. We, however, are able to use detailed information about principal applicant/spouse status to investigate whether individuals' investment behavior is consistent with comparative advantage in the labor market or with traditional gender roles. The panel nature of the

data also allows us to account for any unobserved heterogeneity in households' preferences and aptitude for different human capital investment when constructing investment profiles.

For traditional households, post-migration human capital investments are found to be related to immigrants' pre-migration skill levels. For husbands and wives in these households, higher education levels at entry are associated with higher school enrollment rates immediately after arrival. However, this is not true for non-traditional households. Furthermore, neither own education nor partner's education has an important impact on the incidence of unemployment or job search while employed.

The level of post-migration human capital investment is more closely related to our measures of skill transferability. In households where the visa category would suggest that post-migration investments might be important, we generally see higher rates of school enrollment and job search. In these households traditional gender roles appear to dictate that husbands (whether principal applicant or spouse) make the investments in formal schooling. Husbands holding Independent, Concessional Family and Humanitarian visas are more likely to be enrolled in school than are ENS/BS husbands. At the same time, comparative labor market advantage appears to dictate that principal applicants (whether male or female) make greater investments in job search than their partners who were not subject to any particular selection criteria.

Skill transferability may also be a function of ethnic background. Differences in the level of human capital investment by region of origin point to a relationship between skill transferability and subsequent investment, particularly for women and particularly when we specifically consider investments in unemployed job search. Immigrants from non-English speaking countries are generally more likely to: 1) enroll in school, 2) spend time in unemployment, and 3) invest in job search while employed than are immigrants from English-speaking countries.

This focus on the human capital investment of immigrant families fills an important void in the immigration literature. Policy makers are frequently concerned with establishing criteria for selecting among potential migrants. Yet the extent to which these criteria are successful in promoting immigrants' labor market success depends critically on both skill transferability and subsequent human capital investment.

The focus on families is equally important. Immigration policy typically results in the selection of families rather than individuals, yet individuals—primarily immigrant men—are the unit of analysis in much of the existing literature. Making households the unit of analysis allows more complex interactions in the behavior of individual family members to be assessed. In particular, our results indicate that while immigrant husbands' and wives' investments in employed and unemployed job search are reinforcing, investments in school enrollment are not. Furthermore, decisions about the level of investments in education and job search appear to be based both on comparative labor market advantage and traditional gender roles. Given these complexities, it is vital for immigration research to move beyond simple analyses of individuals towards consideration of the entire immigrant household and towards the adoption of methodological frameworks and data sets that are flexible enough to allow all dimensions of immigrant behavior to be taken into account.

## References

- Baker, Michael, and Dwayne Benjamin. (1997) "The Role of the Family in Immigrants' Labor Market Activity: An Evaluation of Alternative Explanations." *American Economic Review*, vol. 87, no. 4, 705-27.
- Beach, C.M. and C. Worswick (1993) "Is There a Double-Negative Effect on the Earnings of Immigrant Women in Canada?" *Canadian Public Policy*, 19(1), 36-53.
- Beggs, John and Bruce Chapman. (1990) "Search efficiency, skill transferability and immigrant relative unemployment rates in Australia," *Applied Economics*, 22, 249-260.
- Borjas, George (1982) "The Earnings of Male Hispanic Immigrants in the United States." *Industrial and Labor Relations Review* 35(3):343-53.
- \_\_\_\_\_. (1985) "Assimilation, Change in Cohort Quality, and the Earnings of Immigrants." *Journal of Labor Economics*, vol. 3, no. 4, 463-89.
- \_\_\_\_\_. (1991) "Immigration and the Family" *Journal of Labor Economics*, vol.9, no.2, 123-148.
- \_\_\_\_\_. (1992) "National Origin and the Skills of Immigrants in the Postwar Period" in *Immigration and the Work Force*, edited by George Borjas and Richard Freeman, University of Chicago Press.
- Caudill, S. (1988). "An Advantage of the Linear Probability Model over Probit or Logit", *Oxford Bulletin of Economics and Statistics*, 50, pp. 425-427.
- Chiswick, Barry R. (1978) "The Effect of Americanization on the Earnings of Foreign-Born Men." *Journal of Political Economy*, vol. 86, no. 5, pp.897-921.
- \_\_\_\_\_. (1979) "The Economic Progress of Immigrants: Some Apparently Universal Patterns." in *Contemporary Economic Problems*, ed. William Fellner. Washington D.C. American Enterprise Institute.

- \_\_\_\_\_.(1995) “The endogeneity between language and earnings: International analyses.” *Journal of Labor Economics*, vol. 13 Issue 2, pp.247-287.
- \_\_\_\_\_.(1998)“English language fluency Among Immigrants in the United States” *Research in Labor Economics*, Vol. 17, pp.151-200.
- Chiswick, Barry, Yinon Cohen and Tzippi Zach (1997) "The Labor Market Status of Immigrants: Effects of the Unemployment Rate at Arrival and Duration of Residence." *Industrial and Labor Relations Review*, vol. 50, no. 2, pp.289-303.
- Chiswick, Barry and Paul Miller. (1994) “The Determinants of Post-Immigration Investments in Education,” *Economics of Education Review*, 13(2): 163-177.
- Clarke, Harry. (1994) “The Rationale for Forward Planning and Stability in the Migration Program”, *Bureau of Immigration Population and Research*
- Daneshvary, Nasser, Henry Herzog Jr., Richard A. Hofler and Alan M. Schlottmann. (1992) “Job Search and Immigrant Assimilation: An Earnings Frontier Approach,” *The Review of Economics and Statistics*, 482-492.
- Department of Immigration and Multicultural Affairs (2000) “Australian Immigration Fact Sheet” DIMA, Australia.
- Duleep, Harriet Orcutt, and Mark Regets. (1999) “Immigrants and Human-Capital Investment” *American Economic Review* vol.89 no.2, 186-190.
- Duleep, Harriet Orcutt, and Seth Sanders (1993). "The Decision to Work by Married Immigrant Women." *Industrial and Labor Relations Review*, vol. 46, no.4, 67-80.
- Duleep, Harriet Orcutt, Mark Regets and Seth Sanders (1999) *A new look at human capital investment: Immigrants and their family ties*. Kalamazoo, MI: Upjohn Institute for Employment Research.

- Friedberg, Rachel M. (2000) "You Can't Take It with You? Immigrant Assimilation and the Portability of Human Capital" *Journal of Labor Economics*, vol. 18, no.2, 221-251.
- Greene, William H. (1997) *Econometric Analysis, Third Edition*, Upper Saddle River, NJ: Prentice-Hall, Inc.
- Heckman James J. and Thomas E. MaCurdy (1985). "A Simultaneous Equations Linear Probability Model", *Canadian Journal of Economics*, 18, pp. 28-37.
- Inglis, Paul A. and Thorsten Stromback. (1986) "Migrants Unemployment: The Determinants of Employment Success," *The Economic Record*, 310-324.
- Khan, Aliya Hashmi. (1997) "Post-Migration Investment in Education by Immigrants in the United States," *The Quarterly Review of Economics and Finance*, vol.37, Special Issue, 285-313.
- LaLonde, Robert, and Robert Topel (1991) "Immigrants in the American Labor Market: Quality, Assimilation and Distributional Effects", *American Economic Review*, May, 297-302.
- Long, James E. (1980) "The Effect of Americanization on Earnings: Some Evidence for Women." *Journal of Political Economy*, Vol.88, No.3, pp.620-629.
- Macleod, W. Bentley and Daniel Parent (1999). "Job Characteristics and the Form of Compensation", *Research in Labor Economics*, 18, pp. 177-242.
- MaCurdy, Thomas E. (1981) "An Empirical Model of Labor Supply in a Life-Cycle Setting," *Journal of Political Economy*, 89, 1059-1085
- Miller, Paul W. (1986) "Immigrant Unemployment in the First Year of Australian Labour Market Activity," *The Economic Record*, pp. 82-87.
- Mincer, Jacob and Solomon Polachek, (1974) "Family Investments in Human Capital: Earnings of Women," in *Economics of the Family*, ed. Theodore W. Schultz, NBER, University of Chicago Press, 397-429.



- Organization for Economic Co-operation and Development, (1995). *Trends in International Migration*, OECD, Paris.
- Polachek, Solomon and Moon-Kak Kim (1994) "Panel Estimates of Male-Female Earnings Functions," *Journal of Human Resources*, 29(2): 406-28.
- Shaw, Kathryn L. (1989) 'Life-Cycle Labor Supply with Human Capital Accumulation,' *International Economic Review*, 30(2), 431-456.
- Stalker, Peter (2000). *Workers Without Frontiers: The Impact of Globalization on International Migration*, Boulder, CO: Lynne Rienner Publishers, Inc.
- Worswick, Christopher (1996) "Immigrant Families in the Canadian labor Market." *Canadian Public Policy*, pp.378-396.
- Worswick, Christopher (1999) 'Credit constraints and the labor supply of immigrant families in Canada,' *Canadian Journal of Economics*, 32:1, 152-170.

Table 1: Australian, Canadian, and U.S. Immigrants  
by Region of Origin and Broad Class of Admission<sup>a</sup>

	Total	Europe	Asia <sup>b</sup>	Americas <sup>c</sup>	Other
Australia 1994-95 <sup>d</sup>					
Preferential Family	33.3	30.7	44.0	49.1	12.6
Skilled <sup>e</sup>	32.2	36.5	35.9	34.0	19.0
Refugees	15.6	24.5	15.5	4.0	6.4
Other <sup>f</sup>	18.9	8.3	4.6	12.9	62.0
Total Number	87428	25523	38448	3905	19552
Canada 1995					
Family	38.0	22.9	37.2	66.7	36.7
Skilled	50.5	56.1	54.2	26.5	44.7
Refugees	11.5	21.0	8.5	6.8	18.5
Total Number	212504	41266	129106	25621	16511
United States FY1994					
Immediate Relatives <sup>g</sup>	31.5	21.6	30.8	35.9	45.2
Family Preferences	26.5	6.8	25.5	38.7	16.2
Skilled	15.4	10.6	25.0	8.8	17.5
Refugees	15.2	34.2	15.7	4.6	19.6
Other <sup>h</sup>	11.3	26.8	3.1	11.9	1.6
Total Number <sup>i</sup>	798394	160820	292320	314066	31188

<sup>a</sup> Sources: Australia (Bureau of Immigration, Multicultural and Population Research, 1995, Table 2); Canada (Employment and Immigration Canada, 1995, Table IM16); United States (U.S. Department of Justice, 1994, Table 6).

<sup>b</sup> For the Australian totals, Turkey is included in the Asian numbers.

<sup>c</sup> Includes North, South, and Central America.

<sup>d</sup> Australian data is reported from July 1 to June 30. In Canada data is reported by calendar year, and in the United States fiscal year data is reported from October 1 to September 30.

<sup>e</sup> Skilled also includes Concessional Family migrants who are points tested.

<sup>f</sup> Other includes both other visaed immigrants and immigrants for whom no visa is required, mainly New Zealand citizens.

<sup>g</sup> Immediate relatives are family sponsored migrants not subject to numerical caps.

<sup>h</sup> Includes legalization dependents, diversity transition, persons entering under the Amerasian, former H-1 registered nurses, Cuban/Haitian entrant, Soviet and Indochinese parolee and 1972 Registry provision.

<sup>i</sup> Does not include IRCA legalization recipients

Table 2: The Determinants of Post-Migration School Enrollment and Determinants of Fixed School Enrollment Effects by Gender and Household Type

	Traditional Households				Non-Traditional Households			
	Male PAs		Female Spouses		Female Pas		Male Spouses	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
<b>I. Determinants of School Enrollment Levels (Stage 2 Results):</b>								
Own Education								
Less than High School	-0.074***	(0.024)	-0.045**	(0.022)	-0.019	(0.051)	-0.037	(0.053)
High School or Trade	-0.046***	(0.023)	-0.058***	(0.020)	-0.025	(0.046)	-0.024	(0.054)
More than BA	0.008	(0.027)	0.003	(0.032)	-0.013	(0.050)	0.038	(0.062)
Technical/Prof. Degree	-0.011	(0.026)	-0.034	(0.022)	-0.022	(0.043)	0.020	(0.055)
Partner's Education								
Less than High School	-0.038	(0.029)	-0.006	(0.023)	-0.001	(0.040)	0.097	(0.069)
High School or Trade	-0.017	(0.027)	-0.003	(0.019)	0.036	(0.039)	0.103	(0.076)
More than BA	-0.018	(0.033)	0.001	(0.020)	0.082	(0.058)	0.024	(0.061)
Technical/Prof. Degree	-0.026	(0.028)	-0.013	(0.019)	0.013	(0.054)	0.036	(0.053)
Visa Category								
Concessional Family	0.042*	(0.022)	-0.033*	(0.019)	0.035	(0.063)	0.106*	(0.055)
Independent	0.116***	(0.023)	-0.028	(0.021)	0.020	(0.064)	0.108*	(0.063)
Humanitarian	0.052**	(0.023)	0.011	(0.020)	0.105	(0.070)	0.154***	(0.057)
Region of Origin								
Asia	0.071***	(0.022)	0.016	(0.018)	0.288***	(0.039)	0.011	(0.059)
NW Europe	0.027	(0.038)	0.031	(0.050)	0.445**	(0.182)	0.036	(0.154)
SE Europe	0.013	(0.023)	0.009	(0.021)	0.367***	(0.052)	0.008	(0.062)
Other Regions	0.082***	(0.029)	0.036	(0.023)	0.364***	(0.056)	0.048	(0.068)
Sample Size	1197				292			
<b>II. Determinants of School Enrollment Dynamics (Stage 1 Results):</b>								
Years Since Migration	0.186***	(0.023)	0.155***	(0.024)	0.138***	(0.050)	0.191***	(0.054)
YSM*YSM	-0.037***	(0.006)	-0.026***	(0.005)	-0.024***	(0.012)	-0.037***	(0.013)
YSM*Concessional			0.009	(0.012)				
YSM*Independent			0.024*	(0.012)				
YSM*Humanitarian			-0.029**	(0.014)				
Wald Test for visa/ysm interactions (p-value)	.978		.0007		.252		.405	
Sample Size	3291				798			

The additional variables in the fixed-effect linear probability regressions (top panel) include: the State-level unemployment rate at the time of interview, dummies for speaking English well and badly (relative to speaking English only) for both the principal applicant and spouse, dummy variables for children aged 0 – 1, 2 – 5, 6 – 10, and 11 – 18, and a dummy for the presence of other adults in the household. The additional variables in the OLS estimation of the fixed school enrollment effect (bottom panel) include: age and its square for both the principal applicant and spouse, State dummies, a dummy for not being employed in the 12 months prior to migration for the principal applicant and spouse, and a dummy for the presence of other relatives in Australia. \*\*\*, \*\* and \* denote significance at the one percent, five percent and ten percent, respectively.

Table 3: The Determinants of Unemployed Job Search and Determinants of Fixed Unemployment Effects by Gender and Household Type

	Traditional Households				Non-Traditional Households			
	Male Pas		Female Spouses		Female PAs		Male Spouses	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
<b>I. Determinants of Unemployment Levels (Stage 2 Results):</b>								
Own Education								
Less than High School	0.055	(0.046)	-0.061*	(0.036)	-0.028	(0.092)	0.016	(0.085)
High School or Trade	-0.0004	(0.033)	-0.042	(0.032)	-0.159**	(0.076)	-0.099	(0.073)
More than BA	0.001	(0.028)	0.026	(0.039)	0.013	(0.058)	-0.023	(0.070)
Technical/Prof. Degree	-0.012	(0.029)	-0.009	(0.032)	-0.146**	(0.061)	-0.127*	(0.071)
Partner's Education								
Less than High School	-0.055	(0.038)	0.049	(0.042)	-0.003	(0.087)	-0.140	(0.094)
High School or Trade	-0.028	(0.031)	0.019	(0.032)	-0.043	(0.066)	-0.107	(0.085)
More than BA	-0.001	(0.035)	0.048*	(0.029)	-0.010	(0.061)	0.121*	(0.064)
Technical/Prof. Degree	-0.017	(0.031)	0.030	(0.030)	-0.064	(0.064)	-0.087	(0.064)
Visa Category								
Concessional Family	0.346***	(0.029)	0.146***	(0.026)	0.382***	(0.058)	0.151*	(0.081)
Independent	0.374***	(0.026)	0.113***	(0.028)	0.338***	(0.053)	0.139*	(0.075)
Humanitarian	0.500***	(0.037)	0.151***	(0.037)	0.294***	(0.076)	0.266***	(0.092)
Region of Origin								
Asia	0.178***	(0.024)	0.023	(0.023)	0.220***	(0.045)	0.111	(0.070)
NW Europe	0.064	(0.041)	0.050	(0.058)	-0.133*	(0.078)	-0.023	(0.137)
SE Europe	0.209***	(0.035)	0.121***	(0.036)	0.289***	(0.067)	0.179**	(0.086)
Other Regions	0.223***	(0.032)	0.026	(0.032)	0.275***	(0.067)	0.276***	(0.094)
Sample Size	1184				292			
<b>II. Determinants of Unemployment Dynamics (Stage 1 Results):</b>								
Years Since Migration	-0.264***	(0.022)	-0.100***	(0.022)	-0.207***	(0.050)	-0.414***	(0.052)
YSM*YSM	0.069***	(0.005)	0.023***	(0.005)	0.056***	(0.011)	0.088***	(0.012)
YSM*Concessional	-0.070***	(0.011)	-0.020*	(0.011)	-0.083***	(0.028)		
YSM*Independent	-0.100***	(0.012)	-0.026**	(0.012)	-0.097***	(0.028)		
YSM*Humanitarian	-0.037**	(0.013)	0.003	(0.013)	-0.017	(0.027)		
Wald test for visa/ysm interactions (p-value)	Less than .0001		.033		.0001		.300	
Sample Size	3251				794			

The additional variables in the fixed-effect linear probability regressions (top panel) include: the State-level unemployment rate at the time of interview, dummies for speaking English well and badly (relative to speaking English only) for both the principal applicant and spouse, dummy variables for children aged 0 – 1, 2 – 5, 6 – 10, and 11 – 18, and a dummy for the presence of other adults in the household. The additional variables in the OLS estimation of the fixed school enrollment effect (bottom panel) include: age and its square for both the principal applicant and spouse, State dummies, a dummy for not being employed in the 12 months prior to migration for the principal applicant and spouse, and a dummy for the presence of other relatives in Australia. \*\*\*, \*\* and \* denote significance at the one percent, five percent and ten percent, respectively.

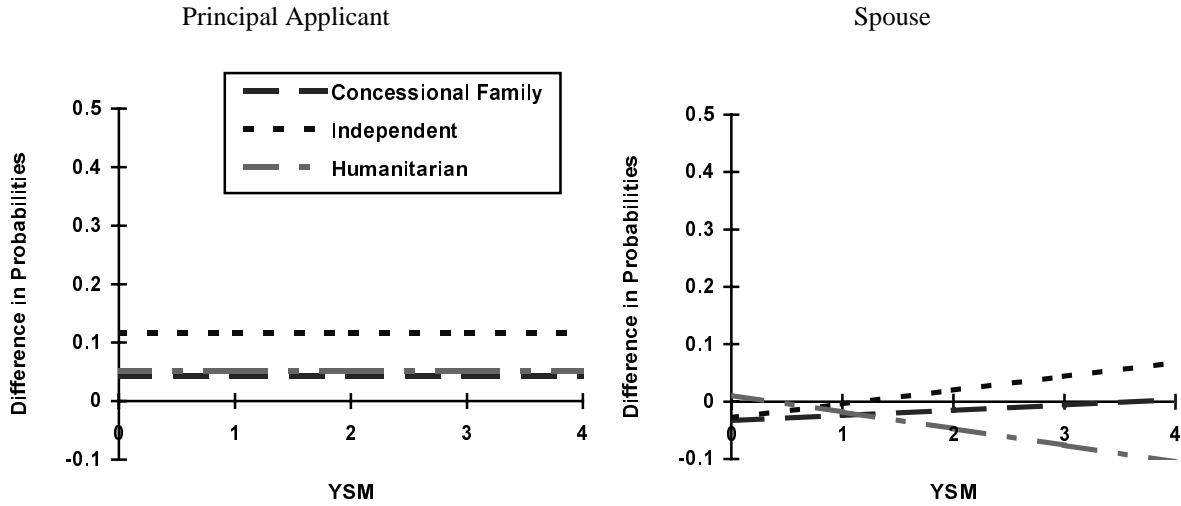
Table 4: The Determinants of Job Search While Employed and Determinants of Fixed Job Search Effects by Gender and Household Type

	Traditional Households				Non-Traditional Households			
	Male PAs		Female Spouses		Female PAs		Male Spouses	
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
<b>I. Determinants of Employed Job Search Levels (Stage 2 Results):</b>								
Own Education								
Less than High School	-0.066	(0.072)	0.024	(0.074)	0.018	(0.199)	-0.139	(0.108)
High School or Trade	-0.078*	(0.046)	-0.043	(0.057)	-0.045	(0.117)	0.027	(0.111)
More than BA	-0.018	(0.040)	0.011	(0.066)	-0.134	(0.097)	0.134	(0.108)
Technical/Prof. Degree	-0.028	(0.044)	-0.017	(0.057)	-0.122	(0.095)	0.094	(0.110)
Partner's Education								
Less than High School	0.019	(0.054)	0.190*	(0.103)	-0.209	(0.129)	0.112	(0.150)
High School or Trade	0.013	(0.045)	0.058	(0.059)	-0.097	(0.112)	-0.177	(0.129)
More than BA	0.058	(0.050)	-0.034	(0.052)	0.031	(0.094)	0.028	(0.106)
Technical/Prof. Degree	-0.025	(0.042)	0.073	(0.058)	-0.115	(0.122)	0.036	(0.103)
Visa Category								
Concessional Family	0.291***	(0.038)	0.127**	(0.053)	0.236**	(0.107)	0.238*	(0.129)
Independent	0.293***	(0.038)	0.054	(0.049)	0.207*	(0.108)	0.102	(0.120)
Humanitarian	0.372***	(0.058)	0.265***	(0.083)	0.155	(0.153)	0.369**	(0.150)
Region of Origin								
Asia	-0.031	(0.035)	0.215***	(0.049)	-0.109	(0.073)	0.225	(0.103)
NW Europe	-0.009	(0.071)	0.093	(0.079)	-0.227	(0.190)	0.006	(0.169)
SE Europe	-0.039	(0.048)	0.156**	(0.062)	-0.154	(0.113)	0.086	(0.119)
Other Regions	0.028	(0.047)	0.144**	(0.061)	-0.182	(0.145)	0.293**	(0.132)
Sample Size	952		534		175		212	
<b>II. Determinants of Employed Job Search Dynamics (Stage 1 Results):</b>								
Years Since Migration	0.019	(0.037)	-0.092	(0.067)	0.076	(0.090)	0.019	(0.094)
YSM*YSM	0.001	(0.008)	0.016	(0.015)	-0.013	(0.021)	-0.019	(0.021)
YSM*Concessional	-.052***	(0.017)						
YSM*Independent	-0.042**	(0.017)						
YSM*Humanitarian	-0.075*	(0.040)						
Wald Test of visa/ysm interactions (p-value)	.007		.859		.106		.571	
Sample Size	2091		888		343		418	

The additional variables in the fixed-effect linear probability regressions (top panel) include: the State-level unemployment rate at the time of interview, dummies for speaking English well and badly (relative to speaking English only) for both the principal applicant and spouse, dummy variables for children aged 0 – 1, 2 – 5, 6 – 10, and 11 – 18, and a dummy for the presence of other adults in the household. The additional variables in the OLS estimation of the fixed school enrollment effect (bottom panel) include: age and its square for both the principal applicant and spouse, State dummies, a dummy for not being employed in the 12 months prior to migration for the principal applicant and spouse, and a dummy for the presence of other relatives in Australia. \*\*\*, \*\* and \* denote significance at the one percent, five percent and ten percent, respectively.

Figure 1  
 Predicted Differences in Probability of School Enrollment  
 By Visa Category (ENS/BS as default) and YSM

Households where Principal Applicant is Male



Households where Principal Applicant is Female

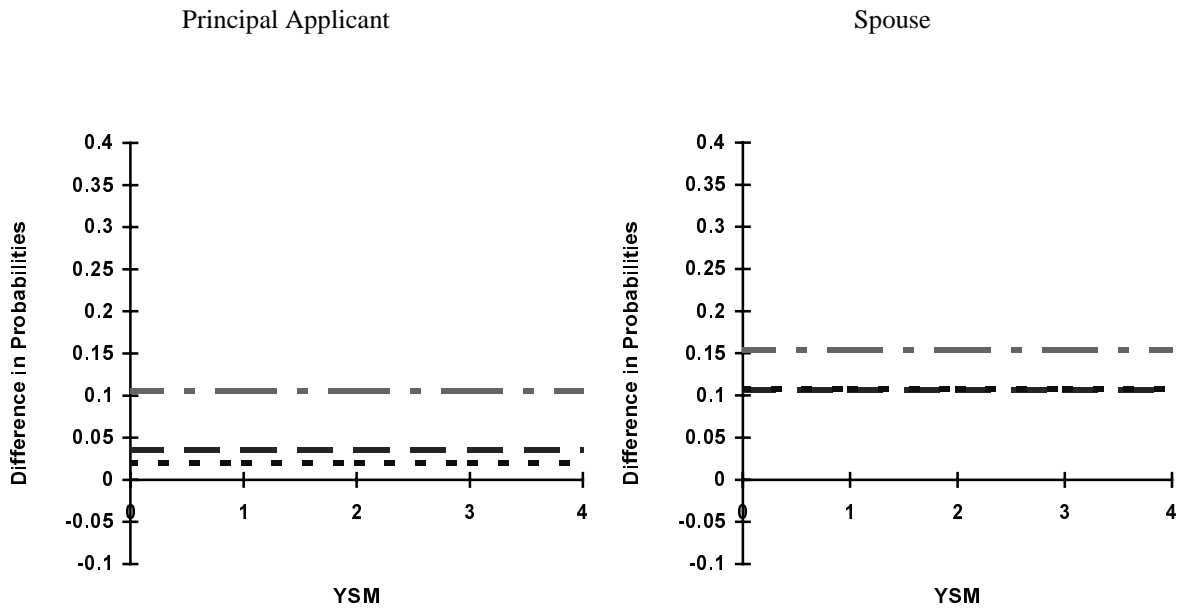
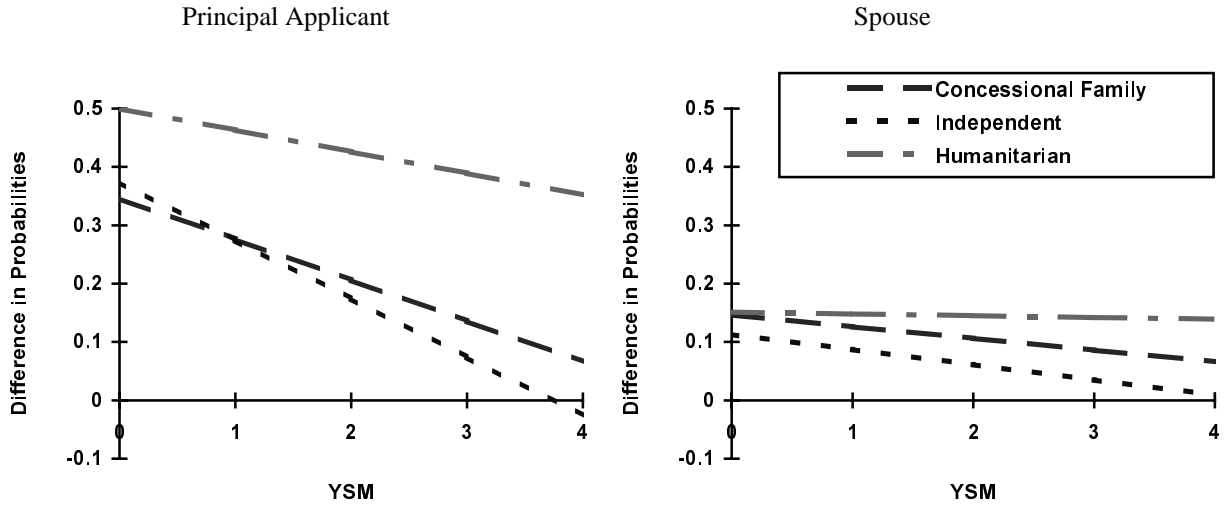


Figure 2  
 Predicted Differences in Proportion of Time Spent Unemployed  
 By Visa Category (ENS/BS as default) and YSM

Households where Principal Applicant is Male



Households where Principal Applicant is Female

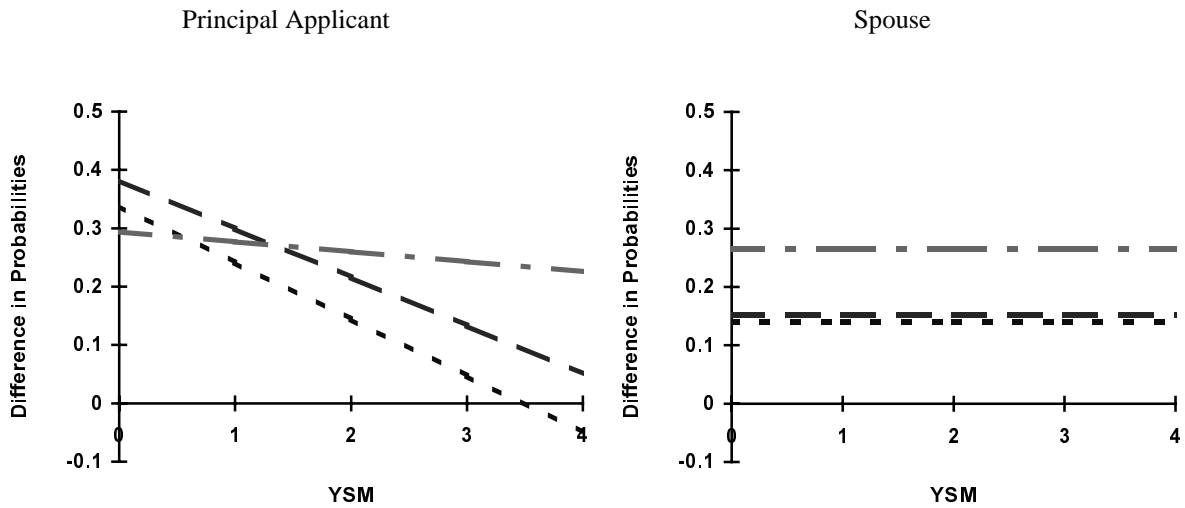
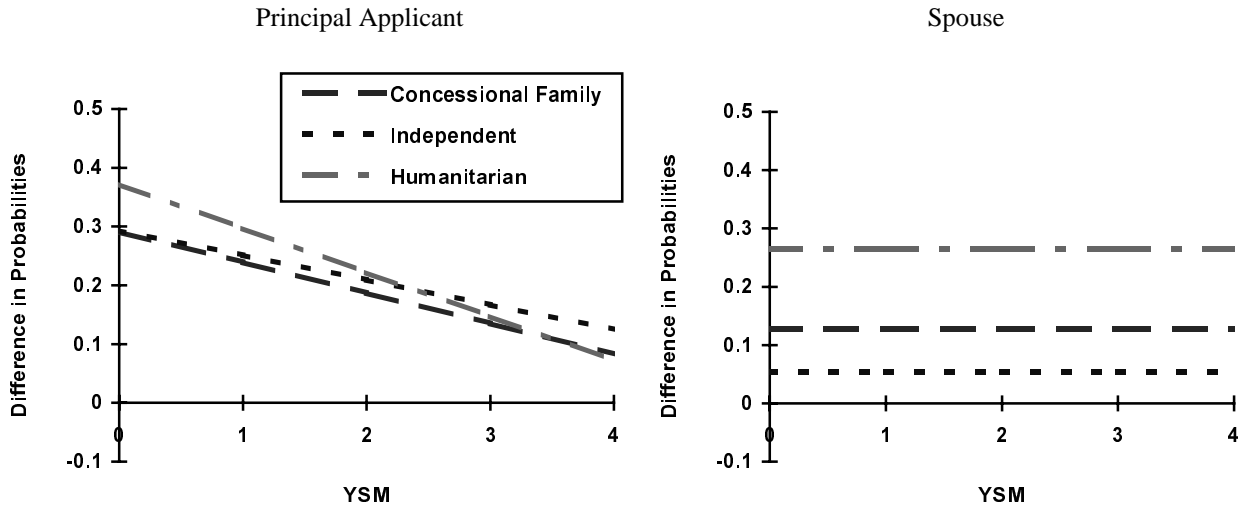
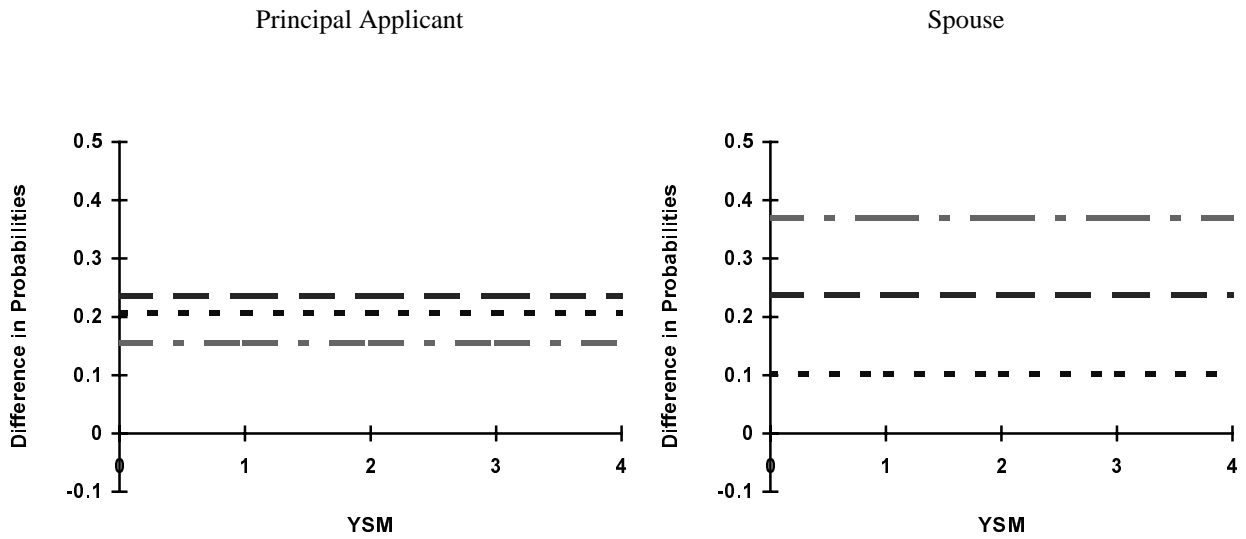


Figure 3  
 Predicted Differences in Probability of Job Search While Employed  
 By Visa Category (ENS/BS as default) and YSM

Households where Principal Applicant is Male



Households where Principal Applicant is Female





## IZA Discussion Papers

<b>No</b>	<b>Author(s)</b>	<b>Titel</b>	<b>Area</b>	<b>Date</b>
211	A. van Soest M. Das X. Gong	A Structural Labour Supply Model with Nonparametric Preferences	5	11/00
212	X. Gong A. van Soest P. Zhang	Sexual Bias and Household Consumption: A Semiparametric Analysis of Engel Curves in Rural China	5	11/00
213	X. Gong A. van Soest E. Villagomez	Mobility in the Urban Labor Market: A Panel Data Analysis for Mexico	1	11/00
214	X. Gong A. van Soest	Family Structure and Female Labour Supply in Mexico City	5	11/00
215	J. Ermisch M. Francesconi	The Effect of Parents' Employment on Children's Educational Attainment	5	11/00
216	F. Büchel	The Effects of Overeducation on Productivity in Germany — The Firms' Viewpoint	5	11/00
217	J. Hansen R. Wahlberg	Occupational Gender Composition and Wages in Sweden	5	11/00
218	C. Dustmann A. van Soest	Parametric and Semiparametric Estimation in Models with Misclassified Categorical Dependent Variables	1	11/00
219	F. Kramarz T. Philippon	The Impact of Differential Payroll Tax Subsidies on Minimum Wage Employment	5	11/00
220	W. A. Cornelius E. A. Marcelli	The Changing Profile of Mexican Migrants to the United States: New Evidence from California and Mexico	1	12/00
221	C. Grund	Wages as Risk Compensation in Germany	5	12/00
222	W.P.M. Vijverberg	Betit: A Family That Nests Probit and Logit	7	12/00
223	M. Rosholm M. Svarer	Wages, Training, and Job Turnover in a Search-Matching Model	1	12/00
224	J. Schwarze	Using Panel Data on Income Satisfaction to Estimate the Equivalence Scale Elasticity	3	12/00

225	L. Modesto J. P. Thomas	An Analysis of Labour Adjustment Costs in Unionized Economies	1	12/00
226	P. A. Puhani	On the Identification of Relative Wage Rigidity Dynamics: A Proposal for a Methodology on Cross-Section Data and Empirical Evidence for Poland in Transition	4/5	12/00
227	L. Locher	Immigration from the Eastern Block and the former Soviet Union to Israel: Who is coming when?	1	12/00
228	G. Brunello S. Comi C. Lucifora	The College Wage Gap in 10 European Countries: Evidence from Two Cohorts	5	12/00
229	R. Coimbra T. Lloyd-Braga L. Modesto	Unions, Increasing Returns and Endogenous Fluctuations	1	12/00
230	L. Modesto	Should I Stay or Should I Go? Educational Choices and Earnings: An Empirical Study for Portugal	5	12/00
231	G. Saint-Paul	The Economics of Human Cloning	5	12/00
232	E. Bardasi M. Francesconi	The Effect of Non-Standard Employment on Mental Health in Britain	5	12/00
233	C. Dustmann C. M. Schmidt	The Wage Performance of Immigrant Women: Full-Time Jobs, Part-Time Jobs, and the Role of Selection	1	12/00
234	R. Rotte M. Steininger	Sozioökonomische Determinanten extremistischer Wahlerfolge in Deutschland: Das Beispiel der Europawahlen 1994 und 1999	3	12/00
235	W. Schnedler	Who gets the Reward? An Empirical Exploration of Bonus Pay and Task Characteristics	5	12/00
236	R. Hujer M. Caliendo	Evaluation of Active Labour Market Policy: Methodological Concepts and Empirical Estimates	6	12/00
237	S. Klasen I. Woolard	Surviving Unemployment without State Support: Unemployment and Household Formation in South Africa	3	12/00
238	R. Euwals A. Börsch-Supan A. Eymann	The Saving Behaviour of Two Person Households: Evidence from Dutch Panel Data	5	12/00

239	F. Andersson K. A. Konrad	Human Capital Investment and Globalization in Extortionary States	5	01/01
240	W. Koeniger	Labor and Financial Market Interactions: The Case of Labor Income Risk and Car Insurance in the UK 1969-95	5	01/01
241	W. Koeniger	Trade, Labor Market Rigidities, and Government-Financed Technological Change	2	01/01
242	G. Faggio J. Konings	Job Creation, Job Destruction and Employment Growth in Transition Countries in the 90's	4	01/01
243	E. Brainerd	Economic Reform and Mortality in the Former Soviet Union: A Study of the Suicide Epidemic in the 1990s	4	01/01
244	S. M. Fuess, Jr. M. Millea	Pay and Productivity in a Corporatist Economy: Evidence from Austria	5	01/01
245	F. Andersson K. A. Konrad	Globalization and Human Capital Formation	5	01/01
246	E. Plug W. Vijverberg	Schooling, Family Background, and Adoption: Does Family Income Matter?	5	01/01
247	E. Plug W. Vijverberg	Schooling, Family Background, and Adoption: Is it Nature or is it Nurture?	5	01/01
248	P. M. Picard E. Toulemonde	The Impact of Labor Markets on Emergence and Persistence of Regional Asymmetries	2	01/01
249	B. M. S. van Praag P. Cardoso	"Should I Pay for You or for Myself?" The Optimal Level and Composition of Retirement Benefit Systems	3	01/01
250	T. J. Hatton J. G. Williamson	Demographic and Economic Pressure on Emigration out of Africa	1	01/01
251	R. Yemtsov	Labor Markets, Inequality and Poverty in Georgia	4	01/01
252	R. Yemtsov	Inequality and Income Distribution in Georgia	4	01/01
253	R. Yemtsov	Living Standards and Economic Vulnerability in Turkey between 1987 and 1994	4	01/01
254	H. Gersbach A. Schniewind	Learning of General Equilibrium Effects and the Unemployment Trap	3	02/01
255	H. Gersbach A. Schniewind	Product Market Reforms and Unemployment in Europe	3	02/01

256	T. Boeri H. Brücker	Eastern Enlargement and EU-Labour Markets: Perceptions, Challenges and Opportunities	2	02/01
257	T. Boeri	Transition with Labour Supply	4	02/01
258	M. Rosholm K. Scott L. Husted	The Times They Are A-Changin': Organizational Change and Immigrant Employment Opportunities in Scandinavia	1	02/01
259	A. Ferrer-i-Carbonell B. M.S. van Praag	Poverty in the Russian Federation	4	02/01
260	P. Cahuc F. Postel-Vinay	Temporary Jobs, Employment Protection and Labor Market Performance	1/3	02/01
261	M. Lindahl	Home versus School Learning: A New Approach to Estimating the Effect of Class Size on Achievement	5	02/01
262	M. Lindahl	Summer Learning and the Effect of Schooling: Evidence from Sweden	5	02/01
263	N. Datta Gupta N. Smith	Children and Career Interruptions: The Family Gap in Denmark	5	02/01
264	C. Dustmann	Return Migration, Wage Differentials, and the Optimal Migration Duration	1	02/01
265	M. Rosholm M. Svarer	Structurally Dependent Competing Risks	1	02/01
266	C. Dustmann O. Kirchkamp	The Optimal Migration Duration and Activity Choice after Re-migration	1	02/01
267	A. Newell	The Distribution of Wages in Transition Countries	4	03/01
268	A. Newell B. Reilly	The Gender Pay Gap in the Transition from Communism: Some Empirical Evidence	4	03/01
269	H. Buddelmeyer	Re-employment Dynamics of Disabled Workers	3	03/01
270	B. Augurzky C. M. Schmidt	The Evaluation of Community-Based Interventions: A Monte Carlo Study	6	03/01
271	B. Augurzky C. M. Schmidt	The Propensity Score: A Means to An End	6	03/01

272	C. Belzil J. Hansen	Heterogeneous Returns to Human Capital and Dynamic Self-Selection	5	03/01
273	G. Saint-Paul	Distribution and Growth in an Economy with Limited Needs	5	03/01
274	P. J. Pedersen N. Smith	Unemployment Traps: Do Financial Disincentives Matter?	3	03/01
275	G. S. Epstein T. Lecker	Multi-Generation Model of Immigrant Earnings: Theory and Application	1	03/01
276	B. Amable D. Gatti	The Impact of Product Market Competition on Employment and Wages	5	03/01
277	R. Winter-Ebmer	Evaluating an Innovative Redundancy-Retraining Project: The Austrian Steel Foundation	6	03/01
278	T. M. Andersen	Welfare Policies, Labour Taxation and International Integration	2	04/01
279	T. M. Andersen	Product Market Integration, Wage Dispersion and Unemployment	2	04/01
280	P. Apps R. Rees	Household Saving and Full Consumption over the Life Cycle	7	04/01
281	G. Saint-Paul	Information Technology and the Knowledge Elites	5	04/01
282	J. Albrecht A. Björklund S. Vroman	Is There a Glass Ceiling in Sweden?	5	04/01
283	M. Hagedorn A. Kaul V. Reinthaler	Welfare Analysis in a Schumpeterian Growth Model with Capital	7	04/01
284	H. Rapoport A. Weiss	The Optimal Size for a Minority	1	04/01
285	J. Jerger C. Pohnke A. Spermann	Gut betreut in den Arbeitsmarkt? Eine mikroökonomische Evaluation der Mannheimer Arbeitsvermittlungsgesellschaft	5	04/01
286	M. Fertig C. M. Schmidt	First- and Second-Generation Migrants in Germany –What Do We Know and What Do People Think	1	04/01

287	P. Guggenberger A. Kaul M. Kolmar	Efficiency Properties of Labor Taxation in a Spatial Model of Restricted Labor Mobility	3	04/01
288	D. A. Cobb-Clark	Getting Ahead: The Determinants of and Payoffs to Internal Promotion for Young U.S. Men and Women	5	04/01
289	L. Cameron D. A. Cobb-Clark	Old-Age Support in Developing Countries: Labor Supply, Intergenerational Transfers and Living Arrangements	3	04/01
290	D. A. Cobb-Clark M. D. Connolly C. Worswick	The Job Search and Education Investments of Immigrant Families	1	04/01