High Skilled Temporary Immigrants in a Segmented Labor Market: A Study of H-1BS

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Abstract

High skilled immigration to the United States is a growing area in immigration, labor, and policy research. Research on this subject focuses on the labor market impact of the largest skilled immigrant group: H-1Bs, temporary visa holders with at least a baccalaureate degree. A host of studies have demonstrated that these workers are paid the prevailing wage, yet they continue to be recruited despite unemployment and wage stagnation in H-1B sectors. This paper argues that to understand the attractiveness of H-1Bs, we must look beyond their effects on wages and unemployment, and frame the flow of skilled immigrants to the US in terms of the broader advantages they provide: flexible labor, the most recent skills, and lower expectations in terms of job quality. Here I broaden the debate on skilled immigrants by examining the relationship between recently arrived immigrant status and two crucial labor market dimensions: contingent employment and eligibility for employer-subsidized healthcare and retirement benefits. In addition, simultaneous equation modeling is utilized to assess the possibility of differing wage models for contingent and core workers in H-1B industries. My findings support the conclusions of prior studies that H-1Bs are not "cheap labor;" rather, this study shows that they are instead utilized as flexible labor.

Introduction

High-skilled immigration is a source of controversy in the United States and receives growing attention in the fields of immigration studies, policy discussions and popular discourse. The H-1B visa, a temporary immigration visa for workers in specialized occupations, is the focus of recent articles on high-skilled migration to the US (Alarcon 2001, Usdansky and Espenshade 2001; Lowell, 2001; 2004). This visa, the largest of the employment visas, receives a great deal of policy attention as well and serves as a central point of contention for anti-immigrant opposition from nativist organizations and skilled unions[1]. The source of debate over H-1Bs lies in the labor market impact of these immigrants: do high skilled immigrants harm native workers?

Two camps emerged in this debate: employers and some policy makers who argued that the H-1Bs are necessary in the face of a shortage of skilled workers, particularly in the Information Technology (IT) industry, and skilled unions who pointed to the growing unemployment rate in high-skilled labor sectors as proof that H-1Bs were being hired in preference to native workers. The visa also drew attack as it became apparent that H-1Bs tend to transfer to permanent residents and thus become sources of long-term competition (Lowell, 2001).

In the politically charged and frantic boom years of the late 1990s, a flurry of policy-orientated research emerged to assess the continuing demand for H-1Bs. Yet thorough and sociologically driven work on the labor market position of high skilled immigrants is lacking (Bach 2001). Above and beyond their effects on wages and unemployment, the flow of skilled immigrants to the US needs to be framed in terms of the broader advantages H-1Bs provide: flexible labor, the most recent skills, and lower expectations in terms of job quality. It is the purpose of this paper to broaden the debate on skilled immigrants by examining the relationship

[1] See the following websites for examples: www.zazona.org, www.h1-b.info, www.h1bsucks.com, amongst others

between recently arrived immigrant status and three crucial labor market dimensions: stability of employment, eligibility for employer-subsidized healthcare and retirement benefits, and wages.

Background

During the "boom" years of the new economy, employers in IT and engineering professions[2] had considerable political clout (Lowell, 2004; Bach 2001). As leaders of the "new economy," their influence is seen in congressional support for the recruitment of highly-skilled immigrants throughout the 1990s. The Immigration Act of 1990 expanded the number of employment-based visa categories and created the H-1A and the H-1B categories from the previous "distinguished merit or ability" H1 visa. This facilitated the recruitment of nurses under the H-1A category, and non-medical skilled workers under the H-1B. While the H-1 category was marked for immigrants of truly special ability, the H-1B opened the visa to all with a baccalaureate degree or its equivalent.

Though the act set a cap of 65,000 applicants per year for the H-1B category and limited the stay to six years, it legitimated the rise in employment-based immigration and facilitated recruitment of the highly skilled (Usdansky and Espenshade, 2001). The cap was raised first to 115,000, then to 195,000 for a three stint through the American Competitiveness in the Twenty-First Century Act of 2000. The wording of the visa was also changed to include immigrants with intent to reside permanently in the US (Lowell, 2001), encouraging more workers to apply and expanding the eligibility for H-1B recruitment to include permanent positions. The facilitation of foreign recruitment in the face of continued unemployment in H-1B industries was a major cause of the controversy over the H-1B visa (National Research Council, 2000).

More recently, the bust of the "IT-bubble" and current recession dampened the debate as the number of petitions for H-1Bs declined. The cap reverted to its original 65,000 in 2003, with

[2] The largest recruiters of H-1Bs

relatively little fanfare (Lowell 2004:2). Although popular discourse on the visa has perhaps subsided in the decline of H-1B industry growth, the case remains theoretically important to the literature of immigration and labor market structure. While there is a proliferation of research on the demand and integration of immigrant labor in the United States, most of this work focuses on immigrants with lower skills. More study is needed to understand the impact of skilled immigrants on the US labor market.

The H-1B Debate

Scholarly research on skilled immigrants has grown rapidly in the past 10 years, yet much of the work has been descriptive and proper models of the demand for and economic integration of H-1Bs are still being developed. Studies on the economic standing of H-1Bs by the National Research Council (2000), the IT Workforce Data Project (2003), and the Committee on Economic Development (2001) have analyzed unemployment rates and wage changes within H-1B industries, though their policy recommendations sometimes conflict[3]. These studies frame both employer demand and H-1B supply as an outcome of labor market expansion and seek to determine the proper balance of foreign recruitment to enable growth without depressing wages. Regardless of how the necessity of foreign recruitment was assessed, these studies generally found that high-skilled immigrants are paid the prevailing wage, sometimes earning more than comparable natives. Unemployment in H-1B industries has also remained low, though not lower than occupations requiring comparable skills (Lowell, 2001).

While these studies assure us that H-1Bs are, by and large, not being recruited to break high wages or to replace US citizens, models which assess only wage differences and unemployment

[3] For instance, the National Research Council finds NO evidence of a shortage of IT workers during the late 1990s, paired with growing joblessness in the higher skilled sectors, whereas the IT Workforce Data Project highlights "tightness" in certain industries and the positive role of highly educated foreign workers in enabling the expansion of the new technology economy.

tell just half of the story of immigrant demand. The small amount of scholarly literature on the subject focuses on models of economic supply and demand. Like the policy work above, these models frame the demand for H-1Bs as the result of a tight labor market, understanding the relatively low unemployment and stable wages in H-1B industries of indicative of "true" market demand (i.e. Storesletten 2000).

Lacking in these indicators is the substantial advantages to employers of using immigrant employees in highly skilled occupations for increased flexibility and to control benefit costs. The 6 year (total) restriction on the H-1B visa, and the dependence of the H-1B immigrant on his or her employer for legal authorization to stay in the US, creates a situation in which the H-1B immigrant has fewer options in employment and is less likely to demand retirement or pension benefits. Explicitly temporary, H-1Bs serve well in "flexible" jobs with heavy turn-over while providing up to the minute skills and possessing, on average, more formal schooling than comparable natives. The savings in terms of reduced fringe benefits and avoiding retraining older employees in new skills can be substantial (Watts, 2001). Few quantitative studies on skilled immigrants, if any, have approached measures of inequality such as occupational segmentation, benefits, or job tenure, though they have been discussed in ethnographic studies elsewhere (Aneesh 2001; Watts 2001; Iredale 2001).

Sociological Framing

Work that incorporates the influx of H-1Bs into more sociological models has grown in the past decade. Some scholars utilize an historical perspective to explain the influx of skilled workers, incorporating networking and social insurance models, such as those used to describe cases of Mexico-US migration, to explain the "high skilled niching" of large numbers of Indian and Chinese H1-Bs and their concentration in just a few urban centers (Alarcon 2001). Using

networks to understand the influx of H-1Bs from a few core sending countries highlights originating factors of this immigration. Yang (1998) has found that high-skilled immigrants likely stem from countries most economically or politically tied to the US, with waiting lists for visas stretching years long. This perspective is fruitful in that it highlights the lowered costs of immigration afforded by a large network of fellow nationals in the country of origin and the self-perpetuating nature of such migration. For instance, in 2002 workers from India made up 33% of all H-1Bs issued, and 63% of all computer-related H-1Bs (US Department of Homeland Security). The incorporation of Indian H1-Bs in the 1960s has served to develop the network capital and ethnic corporations recognized as crucial to continued migration (Alarcon 1999; 2001; Massey 1993)[4]. The concentration of Indians in high-skilled immigration has had significant economic and political repercussions in both the U.S. and abroad, creating a strong ethnic lobby for immigration and foreign policy issues in the US as well as emigration-friendly educational training and relaxed citizenship in the form of the NRI (non-resident Indian) in India (Prasad 1998; Chakravartty 2001).

The effects of immigrant networks on skilled migration is situated within a global system in the work of Saskia Sassen (1998), who argues that American market and media infiltration into developing nations has disrupted their local economies. Empirical studies reveal that foreign investment disrupts even the high-skilled economy (Prasad 1998:436), increasing dependence on the US for employment and creating displaced workers from these nations willing to move (Yang, 1998). This theory speaks to the policy changes that facilitate H1-Bs as well. Well-established networks developed from former Anglo colonization and the expansion of US markets, coupled with English-speaking cheap labor, have made many of the developing H-1B

[4] For instance, a study of the top 100 companies employing H-1Bs in 1998 shows that 60 percent of their CEOs has a South Asian surname (Lowell and Christian, 2000).

sending-nations prime sites for US investment (Iredale, 2001). Foreign students in engineering and the sciences flock to American universities and English speaking schools abroad, creating a ready supply of highly trained, English speaking workers for US firms. The move to facilitate labor immigration in addition to family reunification in the US since 1990 can be understood as part of the "de facto transnationalizing" of immigration policy between sending and receiving nations accounted for by Sassen (1998:6). The H-1B visa, explicitly temporary, is a policy attempt to secure the labor H-1B industries demand while providing control over competition with native workers. In addition to economic considerations, the needs of multinational corporations and ethnic lobbyists receive attention in Congress (Chakravartty 2001; Sassen 1998) because of the importance of H-1B industries for the American economy.

Through their inclusion of international ties that facilitate migration, the sociological models outlined above shed light on why the majority of high skilled immigrants to the United States hail from a small number of countries. Network effects and local economic disruption due to foreign interference spurs the immigration of professionals in a similar fashion as lower skilled immigrants. What these models do not explain, however, is why the systemic employer demand for high-skilled immigrants grew so rapidly in certain industries and exactly what the immigrants were recruited to do.

This demand has grown and been fed with increasingly liberal government policy in the past two decades (see above), despite a highly educated native workforce and considerable numbers of recent graduates in H-1B industries (Gurcaff et al 2001). Networks and global systems help to understand the continued flow of immigrants from sending countries, but do not address specifically the labor market impact of them. If an overall labor shortage is uncertain and H-1Bs

do not cut wages, where and why are they wanted? I argue that the answer can be found in the changing structure of H-1Bs industries.

Contingency in H-1B Occupations

High skilled occupations are generally considered part of the "core" positions in the labor market, affording high wages and stability (Tilly 1996). Yet many H-1B occupations, particularly within the IT industries, are becoming much less stable. The demand for the highly flexible and contract-driven software and service related work is growing at a much faster rate than the more "fixed" jobs of hardware and manufacturing sectors; hence the unstable jobs in the IT industries are becoming a larger proportion of total workers employed (LMID 2000). The problem of "job churning" in IT professions, where jobs are created and destroyed according to short term projects, has been cited as the source of demand for temporary, contractual work that is highly volatile (Watts, 2001; Aneesh 2001).

In addition to the increasing flexibility of the IT labor market, software and service sector work has also grown more standardized in recent years. The "invisible deskilling" of IT labor, including the mandatory standardization of software programming and the introduction of quality control in the IT workplace, has resulted in the greater interchangeability and expendability of lower level IT workers (Prasad, 1998; Iredale 2001). Scholars note that these changes create a growing need for workers to fill lower status, less desirable work, increasing the probability for outsourcing to occur (Prasad 1998, Aneesh 2001). Firms no longer need long-term employees with developed, firm-specific knowledge; increased standardization drives training costs down and renders workers largely indistinguishable.

These changes can result in a drastic reduction of employee bargaining power. Yet the negative outlook developed above does not apply to all non-standard work arrangements[5] in H-1B industries; indeed, a wealth of literature on the "dualism" of non-standard work arrangements (Tilly 1996; Kalleberg et al. 2001; Houseman and Polivka 2000) informs of the *preference* of many skilled workers for greater flexibility. Researchers such as Carnoy et al. (1997) and Lautsch (2002) find considerable variation in the quality of part-time, contractual and contingent work. Many non-standard work arrangements are at the employee's request and still entail substantial healthcare, retirement, and vacation benefits. Others are used as a "screening process" before hiring workers on for the long term (Houseman and Polivka 2000).

Across the board, however, more and more work is becoming "flexible" and the percentage of people employed in such jobs with benefits is usually less than 50%, as compared to 70% or more in standard work arrangements (Tilly 1996). It is therefore safe to assume that regardless of employee preference, there are considerable savings in fringe benefits and flexibility by employing workers in non-standard arrangements.

Though descriptive work on the changing labor market structure of H-1B occupations clearly exists, no one has yet empirically demonstrated the connection between this shift towards greater fluidity in the labor market and the labor market impact of the high-skilled immigrant. This is an important omission with policy implications, for to evaluate the "true" need for further immigrants we need to fully understand what positions they fill. If H-1Bs present no clear wage advantage over native workers, and the demand for them does not seem to correspond to unemployment levels in H-1B industries, then their value, perhaps, lies in their function "to moderate wage pressures and maximize organizational flexibility (Bach, 2001)." It is this

[5] Defining non-standard/contingent work is a difficult task (Tilly, 1996; Castells, 1997; Lowell 2000) and will be discussed at greater length in subsequent sections of this paper. For the moment, non-standard jobs are any jobs that are not full-time or that last for less than one year.

function that will be explored in this paper, by testing hypotheses drawn from the segmentationalist theory outlined below.

Labor Market Segmentation

How is the demand for skilled immigrants related to the need for flexibility in H-1B occupations? In his seminal work *Birds of Passage*, Micheal Piore (1979) emphasizes that to understand the demand for immigrants, we must understand the segmentation of the labor market in developed nations. A "dual labor market" exists in developed nations, split into two inherently different sectors with unequal outcomes. The secondary labor market represents a permanent underclass of jobs whose undesirable characteristics make them difficult to fill with the native labor force; generally lesser skilled, ranking low in prestige and pay, they offer little or no opportunity to develop the firm-specific skills necessary for advancement. Such jobs are viewed as "flexible," the lack of firm specific skills make such workers expendable and the low prestige and pay undercuts the development of loyalty to the employer as well. In contrast, the primary labor market can be viewed as "fixed" labor capital, invested in and trained by their employer and therefore not easily replaced. Workers in these jobs are rewarded with greater job security, better benefits, and higher wages.

Piore (1979) hypothesizes that there exists a "fundamental dichotomy between the jobs of migrants and the jobs of natives (Piore 1979: 35)". This dichotomy is sharpest within lower skilled positions, but "where skilled migrants can be found and the market can be structured in such a way that they are confined to the variable portion of the demand, the theory suggests that they will be utilized even in the jobs that otherwise would belong to the primary labor market (Piore 1979: 40)." Immigrants will be more likely to fill the undesirable secondary labor jobs, as they "match" the temporary needs of the immigrants. Likely to come from less developed

countries with lower expectations and a plan for eventual return, immigrants are willing to work at jobs that natives disdain.

While the occupations of H1-Bs are generally considered part of the primary market, due to their high skill qualifications, they are becoming increasingly unstable. In the previous section, I outlined some of the mechanisms leading to high-skilled instability: short product cycles and rapidly evolving technologies place tremendous pressure on firms to maintain labor flexibility, which they accomplish by creating contingent jobs, de-skilling the work, and outsourcing. Thus, employers attempt to shift the burden of the instability of their product unto the workers through the creation of jobs that, though within high-skilled industries, nonetheless resemble secondary labor market jobs. The dual labor market perspective links this attempt to the demand for immigrants: with generally lower expectations, immigrants will be more willing to fill secondary labor jobs.

High Skilled Segmentation: Research Questions and Hypotheses

Framework

Though still influential, Piore's idea of an unyieldingly rigid bifurcated market has lost validity in the past decades, as empirical tests of its explanatory power have remained inconclusive (Dickens and Lang, 1985). The concept of segmentation in the labor market, however, has been fruitfully elaborated by the work of Charles (1998) and Chris Tilly (1996;1998) in recent years by reintroducing the idea of differential and inherently unequal *categories* of jobs in capitalist societies; indeed, even at the micro-level within firms, an internal division of labor is observed (Tilly 1996; Carnoy et al 1997). Though more porous than the impenetrable stratified markets of Piore, these categories are expressed in very different career trajectories.

In insecure markets, firms seek to reduce the risk of shouldering unnecessary employees during economic slowdowns. One of the ways to do this is by creating categorical distinctions within the firm by clearly defining who belongs to the core of the firm and who is peripheral. Coined the "command and promotion pool" by Tilly (1998), the core jobs represent work intended for the long haul, where workers are highly trained in "local firm knowledge" and accrue a variety of non-wage benefits in the form of health care, retirement, and investment options, at considerable cost to the employer. In such jobs, stable employment and the opportunity for advancement is implicit. It is from these ranks that companies draw most of their future leaders (Tilly, 1998:79; Kalleberg et al 2000:274).

On the other hand lies the peripheral jobs, or "turn-over pool:" workers without these explicit promises, whose temporariness both justifies their lack of benefits and the lack of in-house training expended on them. Though there is greater permeability between these two sectors than is allowed under the dual labor market perspective, workers in the periphery tend to stay there. It is exactly this kind of implicit division that is observed in much of the qualitative literature on contingency in H-1B occupations: job churning to match short product cycles (Watts 2001), the need to recruit those with the latest skills without the cost of training (Waldinger and Erickson 2000), standardizing code to allow for greater worker expendability (Prasad 1999), and annual turn-over rates as high 15-25% in high-tech companies (Carnoy et al 1997). Expanding the role of periphery jobs creates substantial savings to the employer by both increasing personnel flexibility through uncertain tenure, as well as legitimating fewer fringe benefits or in-house training.

Building on Piore's concept of a "match" between the needs of immigrants and their employers, Tilly conceptualizes the recruitment of immigrants (or any other "outsider") for

periphery jobs as an overlapping of categories. The match between the within-firm/industry category (turn-over pool) and the external category (temporary immigrant) fits this conceptualization of layering categories. Overlapping categories of inequality does analytical work in justifying lower-cost employment situations: it makes sense to hire an H-1B, as a categorical outsider, for the peripheral jobs as "matching interior with exterior boundaries (reinforced inequality) produces a low-cost, stable situation… (Tilly 1998:79)". In the case of the H-1B, this match can even be seen as state-supported; the stipulations of a temporary non-immigrant visa render the H-1B a perfect fit for the uncertain, volatile sectors of H-1B occupations. The workers are explicitly temporary and thus have no claim to long-term employment or advancement opportunity. Dependent on their employer's sponsorship for legality, H-1Bs are unlikely to demand health or retirement benefits. Most of these workers are young and recently trained, so initial hiring costs are minimal (Alarcon 1999).

Conceptualizing core and periphery job categories within the skilled labor market leads to the motivating question of this paper: is membership in the *external* category of H-1B immigrant "matched" with the *internal* category of periphery, turn-over jobs within the H-1B occupations? It is the purpose of this paper to examine whether or not H-1Bs do indeed occupy a qualitatively different place in the labor market then that of natives. My analysis includes three different indicators of peripheral jobs: contingent employment, lack of fringe benefits, and lower wages.

Hypotheses

Work that is of uncertain duration generally comes with a host of unfavorable consequences, as outlined above. The lack of benefits, employment security, and opportunity for advancement renders contingent work internally distinct and less desirable than work in the command and promotion pool, even within high-skilled firms. H-1Bs, workers made peripheral

by the very temporary nature of their visa, are more likely to be "matched" with periphery work within their firms. Due to limitations in available data, this paper cannot isolate H-1Bs from other immigrants. In order to test the conceptualization of matching H-1Bs with peripheral work, I isolate those skilled immigrants most likely to fall under a temporary visa category, of which H-1B is the largest, and explore their possible relationship to contingent work.[6] *H_1: Recently arrived immigrants will be more likely to experience contingent employment than less recent and native workers.*

I discussed the growing instability amongst H-1B professions, and connected this instability with temporary immigrant workers. Product cycles and the demand for workers skilled in the latest technologies varies amongst industries, and the firms most vulnerable to instability will be the most likely to shift this instability unto their workers. Among H-1B industries, there is variation in the proportion of "turn-over" pool jobs. This paper attempts to isolate "hi-tech" industries, which have been shown to be especially volatile, and examine their particular relationship with contingent work. While the first hypothesis deals with the relationship between characteristics of the worker and contingency, my next hypothesis deals with the relationship between characteristics of the occupation and contingency. *H_2: "High-tech" fields, in which the need for newly trained workers is particularly essential, will be more likely to employ contingent workers*.

Beyond the greater flexibility offered by contingent workers, and the greater control offered by immigrants dependent on work for visa status, firms also reap savings by withholding benefits from their periphery workers. The studies reviewed above all found lower rates of employer subsidized benefits amongst the contingently employed as compared to core workers.

[6] More details regarding how I do this follows in the data and methods section.

While most of those studies focused on lower skilled workers, the logic of core/periphery workers I am developing suggests that periphery workers at high skill levels would be less likely to receive benefits as well. The temporariness of contingent workers should provide justification for their ineligibility for benefits at all skill levels. The temporariness of immigrants with an H-1B visa should do the same. *H_3: Recently arrived immigrants (external outsiders) and contingent workers (internal outsiders) will be less likely to be eligible for retirement and healthcare benefits*.

The "high-tech" firms contrast this hypothesis. While flexibility is crucial for such firms, there is exceptionally high demand for the most highly educated and most recently trained workers within these fields. The rapid product cycle demands innovative developers, particularly within software, with the most cutting edge skills. The greater selectivity in high-tech occupations will reflect in greater eligibility for employer offered benefits. These workers are simply in too high of demand to work for less, and therefore will be offered benefits regardless of contingency. Such workers will be more representative of the "good" contingent jobs noted above. *H_4: "Hi-tech" industries will be more likely to offer retirement and healthcare benefits.*

A final indicator of periphery jobs is low wages. Following previous studies, I examine the effects of recently arrived immigrant status on wages. As the H-1B visa demands that immigrants receive the same wages as similar natives, I predict that, on average, recently arrived immigrants will be paid the prevailing wage. My analysis departs from previous studies, however, in that I also examine the effect of contingent employment on wages in the H-1B industries. If the H-1B labor market truly is segmented in the way I suggest above, we should observe differing wage equations for workers in the contingent and core sectors. I expect that contingent workers, taken as a whole, will earn less than workers employed in core jobs. *H_5:*

Recently arrived immigrants will be paid the prevailing wage, but contingent workers will be paid below the prevailing wage.

Data

The Current Population Survey

I test hypotheses drawn from the segmentation perspective by analyzing data from the February releases of the Current Population Survey (CPS) for the years 1995-2001. The CPS provides information on the nativity of high-skilled workers as well as on their employment, wages, overall numbers and other demographic characteristics. Conducted by the Bureau of the Census for the Bureau of Labor Statistics, it is the premier source of data on the American labor force. This monthly survey is based on a nationally representative sample of approximately 48,000 households, excluding persons in the armed forces and institutionalized living quarters. The multi-stage area probability sample is based on 1990 census information, and data are from detailed questions about the working status of everyone in these households. Each household is interviewed once a month for four consecutive months one year, and again for the corresponding time period a year later.

February Series

For odd years from 1995-2001 (1995, 1997, 1999, 2001), the February CPS series includes a Contingency Labor Supplement, an additional set of questions asked of all applicable persons in the sample ages 15 and older. This file contains additional information on contingent and temporary work, satisfaction with current work, employee benefits, and earnings. Important variables for this analysis are several definitions of contingent labor, employer-subsidized healthcare and retirement benefits, and expectation of duration of employment. In the February series, wage information is obtained only for workers who are part of an out-going rotation

sample (approximately one-quarter of the total sample).[7] In order to ensure a large enough sample of workers in H-1B occupations for analysis, particularly of immigrants, survey years 1995-2001 were merged and analyzed together. The series is used to assess the effect of being a recently arrived immigrant on both wage and non-wage labor market characteristics in H-1B occupations. It would have been interesting to extend the analysis until 2003, thus observing any possible changes in the data as a result of the economic slowdown at the beginning of this decade. Unfortunately, the supplement was discontinued after 2001 and so it is impossible to determine what the effects of the IT "bust" and its aftermath would have on the offered benefits and contingency levels in H-1B occupations. Still, these data are the best resource for contingency labor information amongst my population of interest.

Sample

The sample includes both native-born and foreign-born workers. The latter include naturalized citizens, permanent aliens, legal temporary workers, and unauthorized workers. Unfortunately, it is not possible to distinguish between resident aliens who are permanent, legal temporary, or unauthorized. Given the skill composition of this labor force it is very unlikely that there are any unauthorized workers of note (Lowell 2001).

Though it is possible to do so, I do not differentiate the foreign born by citizenship. Instead, the composition of the legal foreign-born class is indirectly proxied by years spent in the United States. For the purposes of my analyses, which seek to determine the effects of H-1B status on indicators of turn-over pool jobs, years since immigration provides a better measure of my independent variable of interest: temporary immigrant status. Most classes of temporary visas do not permit indefinite stays and the largest temporary class of admission, the H-1B visa,

[7] Only the March CPS asks all workers in the sample for their earnings. Otherwise, all monthly supplements consist of four changing sub-sample groups that rotate into and out of the CPS over the year. Only the outgoing rotation group is asked about wages because it is such a sensitive question.

permits no longer than six years stay. Therefore, it is safe to assume that practically all workers who report having been in the United States for seven or more years are either permanent resident aliens or naturalized citizens. Given previous research about these populations, most all workers in my sample who report having been in the country for six years or less are most likely to be temporary visa holders (Yearbook of Immigration Statistics, 2002; Lowell 2001). In my attempt to isolate the effects of temporary immigrant status, the inclusion of citizenship is redundant to years since immigration as respondents most likely to be H-1Bs are not citizens[8].

Using the merged 1995, 1997, 1999, and 2001 series of the February CPS, I restrict my sample to employed persons aged 16 and older in the US civilian labor force. Only employed individuals are included as, in contrast to family-related or high capital visa categories, the validity of the H-1B visa rests on constant employment. Labor market attachment and unemployment differentials are therefore of little interest to this analysis.

Though recruitment of H-1Bs is legally restricted only by the minimum skill requirement of a baccalaureate degree, 92% of H-1B beneficiaries were concentrated in the top-10 H-1B occupations reported by US Department of Homeland Security in 2002[9]. I therefore distinguish H-1B occupations by matching CPS primary occupational categories with the top-10 occupations outlined in the Yearbook. As the occupational categories in the Yearbook were very general, I chose the CPS categories that most closely fit under these more general headings. My selections, and the yearbook description which they fall under, are found in Appendix A. I restrict my

[8] Of the foreign born with 5 years immigration or less, only 7% were citizens. The addition of a citizenship dummy was attempted in all models, and was only significant in the prediction of contingent status. In predicting contingent status, including citizenship drastically reduced the coefficients for each of the years since immigration variables, rendering them all insignificant. I did not include citizenship in this model, however, for the reasons outlined above; citizenship coincides almost completely with years since immigration, and as only 7% of my population of interest (immigrants most likely to be temporary visa holders) are citizens, this distinction is not as useful as years since immigration in determining the effect of temporary immigrant status.

[9] 2002 Yearbook of Immigration Statistics, which includes an especially thorough section on the characteristics of H-1Bs. Occupations included are found in Appendix A.

sample to only include respondents who report an H-1B occupation as their primary job. Restricting my sample to occupation, rather than restricting by education or experience, allows me to assume with greater assurance that I have captured those immigrants most likely to be H-1Bs. This results in a subpopulation of 25,818 (about 5% of all respondents) reporting employment in 23 H-1B occupations.

Next, the sample was reduced to include only those respondents who participated in the Contingency Labor Supplement, for a loss of 6,397 cases. This is necessary to maintain a consistent sample for comparison and weighting purposes, as benefit and contingency status information were part of the supplement questionnaire. As the supplement is assigned to a random subset of the overall sample, supplement weights are provided, and the number of cases remains comfortably large (N=19,421), this loss of cases is not problematic. For each of the three analyses outlined below, the sample is further restricted to include only those with complete information on the variables included in all models. This was accomplished through listwise deletion, resulting in a reduced sample size of 16,946 for the benefits analysis and 4,472 for the wage analysis. Further details regarding each analysis are elaborated later.

This paper focuses on three separate indicators of core versus periphery jobs. Each was chosen to address a different dimension of periphery jobs as defined by both Chris and Charles Tilly (1996;1998) along with a host of other labor scholars (Kalleberg 2000a; Kunda et al 2002; Cornoy et al 1997; Lautsch 2002). Contingent employment, lack of fringe benefits such as healthcare or retirement, and lower wages are all indicators of flexible, periphery "turn-over" work.

Dependent Variables

Contingency

For the purposes of this paper, contingent workers are those wage and salary workers who are not self-employed or independent contractors and are a) in a temporary job or a job that could not last as long as they wish, b) expecting their job to last a year or less for non-personal reasons, c) in a job where they were explicitly hired to replace another person or complete a certain project for less than a year, d) employed by temp "headhunting" agencies, or e) identify as on-call or day laborers. This definition of contingency was chosen as it most closely reflects the "turn-over pool" characteristics as described by Tilly (1996;1998) and the "bad jobs" described by Kalleberg (2000) within professional labor markets. My contingent definition is restricted to jobs of limited duration due to non-personal reasons, eliminating the possibility of choice or 'good' flexibility that is self-chosen for child-rearing or health reasons (Conroy 1997; Kunda et al 2002). Self-employment is excluded for the same reason. As it is legally necessary for H-1Bs to maintain full-time work status, I do not include part-time workers in my definition.

The inclusion of employees of temp-firms stems more specifically from the literature on H-1Bs. Within H-1B occupations, particularly in "high-tech" fields, the use of temporary agencies and contracting firms is a common way of acquiring flexible skilled labor without incurring the costs of providing training or firm-specific knowledge. Iredale (2001) and Watts (2001) have shown that these "head-hunters," who contract out their workers and serve as their official employer on visa applications, absorb the legal responsibility for H-1B visa standards. Frequently operated by co-nationals, these intermediaries serve as a legal shield for exploitative work sites and provide further categorical separation between core and periphery workers in the

hosting firm. It is therefore crucial to include these kinds of workers in any definition of skilled contingent workers.

Finally, on-call work is largely regarded one of the least stable, and generally least desirable, forms of contingent employment, as it entails virtually no responsibility from the employer and total vulnerability to unemployment for the employee (Kalleberg 2000; Tilly 1996). High-skilled workers found in such positions are likely to be at the bottom of the rung within their firm of employment, and thus represent an important dimension of internal inequality.

The definition of contingent employment developed in this paper operationalizes "bad jobs" more concisely than more expansive definitions. While contingent work can generally be defined as any job that departs from "standard" work arrangements in which the employee works full-time, for an indefinite amount of time, at the employer's place of business and under the employers direction (Kalleberg 2000), these jobs need not always be peripheral nor of poor quality (Kundra et al 1999). Some of the more common definitions applied in the literature stem from different theoretical underpinnings regarding the meaning, causes and effects of such nonstandard work. These definitions are delineated in Table 1.

[TABLE ONE HERE]

The first definition is "jobs of uncertain duration," a widely applied definition including all jobs of uncertain tenure (Polivka and Nardone 1989). This definition is narrow, as it includes only those workers who do not expect continued work and whose hours vary; it omits stable temp or part-time work and emphasizes high-skilled workers who temporarily enter instable work for personal reasons. Though it includes informal workers, it undercounts workers who are

employed in continuing nonstandard arrangements, arrangements which cut the costs of providing benefits, training, and continued employment through business lows to workers.

The next definition is broadened to include all workers who have weak "attachment" to their employer or place of work, including temporary workers, part-time workers, the self-employed and workers in business services (Belous 1989; Conroy 1997). This definition throws in most nonstandard workers together, whether voluntary or involuntary, self-employed or not, regardless of working conditions. This definition stems from the perspective that those with weak attachment to their jobs are less likely to be highly skilled or valued, and are more difficult to unionize. While I agree, including the self-employed weakens the analytic usefulness of this definition; though some workers may be self-employed due to an inability to find regular work, it is unreasonable to assume that most are. In addition, including the self-employed muddies any examination of benefits and wages: eligibility for employer-sponsored benefits is a given if the worker and the employer are the same person, and as the self-employed set their own wages they are not comparable with other kinds of contingent workers.

The third definition, a modified version of which I adopt for this paper, focuses on part-time positions with heavy turn-over and little opportunity for advancement (Tilly 1996). These jobs include part-time, contractual, and temp work in both skilled and unskilled industries, though the emphasis tends to be on the low skilled. This definition seeks to isolate "secondary" sector jobs, regardless of stability, because of the substantial benefits accrued to the employer at the expense of the worker. As outlined in the background section above, such jobs can be permanent positions within even high-skilled firms, an enduring "turn-over pool" of workers which can be hired and fired at will.

Definition 4 in the table below represents my definition developed for this paper. It is much narrower in scope and more precisely indicates "bad jobs." Particularly as contingent status is used as one indicator of periphery jobs, and not an outcome to itself, it is crucial to refine my definition to isolate those contractual, temporary workers who are most likely to be part of the turn-over pool.

Fringe Benefits

A lack of employer-subsidized fringe benefits is another important dimension of turn-over pool jobs, and one of the crucial distinctions between "good" and "bad" contingent work. The CPS includes information on both retirement and health care benefits. This analysis focuses specifically on *eligibility* for employer-offered healthcare and retirement. Fringe benefits are coded as a four category variable: no eligibility for benefits, eligible for healthcare only, eligible for retirement only, or eligible for both. Eligibility for healthcare was coded to include all workers who a) received healthcare from their primary employer, b) received healthcare through a spouse or family member but were eligible for healthcare through their employer, or c) purchased their own healthcare or received healthcare from a second job, but were eligible for healthcare from their primary employer. This ensures that even if the respondent opted for another healthcare option, they were still included in the positive category if they were eligible for healthcare from their employer. I chose this definition, instead of the more common dichotomy of having healthcare from any source or not, because of the high average skill and compensation level of my sample, such that a full 93% had healthcare.

Retirement benefits are likewise positively coded according to eligibility. Retirement is coded as positive if a) respondent is covered by an employer-sponsored retirement account such as an IRA or Keogh plan, b) respondent is eligible for a retirement plan but declines because of

personal reasons, or c) respondent is eligible but declines because s/he feels it is too expensive. Again, this definition isolates those with no retirement benefits solely due to the lack of an employer to provide them. Regardless of whether the employees are covered elsewhere or not, an employer saves money by not offering benefits to its internal turn-over job pool. While contingent work status gives employers increased control over their workers, ineligibility for benefits allows them to save money at the worker's expense.

Wages

Following the economic and sociological convention, wages are observed as the natural log of a continuous wage variable. Wages in the CPS are recoded as weekly income, which includes overtime for salary earners. This is more appropriate for my analysis than hourly wages, which are also provided, as many workers at this skill level are salary earners, and many work considerable overtime.

Independent Variables

Explanatory variables included are both traditional labor market indicator, as well as specific categorical variables drawn from the segmentation literature. The traditional indicators are largely introduced as controls, allowing me to isolate the effects of categorical membership and occupation on my dependent variables.

Control Variables

As a common indicator of human capital, education is included in all analyses. When assessing the effect of education on contingent work and fringe benefits, education is divided into a set of categorical variables. Categorical coding of education emphasizes the power of official certification that is lost in a continuous "years of education" variable, allowing some years of schooling to differ in effects from others. These categories include high-school degree

or less, some college or an associates degree, Bachelor of Science or arts (B.A. or B.S.), masters degree, a professional degree (J.D. or M.D.) and PhD. Increased educational certification is hypothesized to have a negative effect on the probability of contingent employment but a positive effect on the probability of eligibility for fringe benefits and wages, as those with higher human capital are more likely to enjoy these core job characteristics. For wages, the reduced sample size (only one third of the sample was asked for wage information) and simultaneous equation modeling[10] necessitated treating education as a continuous variable. The hypothesized positive relationship between education and wages remains the same.

A related variable of interest is completion of a foreign degree. Perhaps an association between recently arrived immigrant status and periphery work indicators can be attributed to lower returns on foreign certifications as compared to education completed in the US. To assess whether or not a significant difference in educational returns exist, I construct a foreign degree interaction. This is constructed by subtracting age of immigration from age at completion of schooling. Age of immigration was computed by first subtracting year of immigration from year of survey, and then subtracting the difference from the respondent's age. Age at completion of schooling was computed by subtracting years of schooling plus six from respondent's age. If the difference between age of immigration and school leaving age is negative, the respondent scores "0" on a "foreign degree completion" dummy variable, as they immigrated before completing schooling. If the number is positive or zero, the respondent scores "1" on this variable, as they completed schooling outside of the US[11]. This variable is then multiplied by each of the education variables to create interactions.

[10] Separate wage modeling is used for contingent and core workers, resulting in a contingent wage sample of only 310 respondents. Including education as a dummy variable rendered all coefficients except one (male) insignificant.
[11] Very few institutions will award a degree with less than one year of coursework completed there. Therefore, I assume that immigrants who immigrated the same year as degree completion were awarded a foreign degree.

As another measure of human capital, labor market experience is expected to be negatively associated with contingency while positively associated with wages and eligibility for fringe benefits. Labor market experience is defined according to convention as age-(years of school + 6). As experience is widely noted to have diminishing returns at higher levels, I include a squared term for experience. Sex is included as a dummy variable, and given the persistence of gender inequality in the labor force I expect women to be more likely to be employed contingently and less likely to be eligible for benefits and high wages. Marital status is positive if the respondent is married with the spouse present, and negative otherwise. It is expected that married respondents are more likely to enjoy higher wages, better benefit coverage, and lower chances of contingent work, as married individuals tend to be more "settled" in their careers and more likely to need to support a family.

Independent Variables

Of greatest interest to this study are independent variables testing whether membership in the external category of temporary immigrant (H-1B) predicts membership in turn-over sectors of the high-skilled labor market. Unfortunately, the CPS does not collect data on the specifics of immigration status, providing only nativity information and years since immigration. A proxy for immigration status was created through several steps. First, the CPS separates year of immigration into a series of categories that, in the most recent years, are inconsistent across and overlap according to survey year.[12] Most recent immigrants were generally combined in a category consisting of four years together in order to preserve the confidentiality of this small population. In order to construct a consistent and continuous year of immigration variable, I first recoded these categories for consistency across years and then randomly imputed year values within the categories. This constructed continuous years since immigration variable was used to

[12] See Appendix B for more complete information on this recode.

represent immigrant status for the wage analysis, due to the small numbers of immigrants in the wage sample. For the other analyses, years since immigration are coded into a series of dummy variables: 5 years of immigration or less, 5-10 years since immigration, 10-15 years since immigration, or 16 years since immigration or more. Once again, this allows the effect of years since immigration to vary according to the amount of time. The five years or less dummy can therefore be used to proxy H-1B status; as the visa cannot be extended past 6 years, we can safely assume that less recent immigrants have transferred to permanent residency status.

The next variable included was a dummy variable representing occupations defined as "hi-tech", generally cutting edge occupations in the IT industry with particularly high skill requirements (mathematical and computer scientists, natural scientists, and high-skilled technicians)[13]. These occupations are found in industries where rapid innovation requires the most up to date training and higher levels of formal education (Waldinger and Erickson, 2000; Watts 2001). Short product cycles are characteristic of the IT market,[14] creating an especially urgent need for the most up-to-date employees for each particular project. Thus results spikes of intense demand for workers with very specific skills; yet the demand is also equally *temporary* as it is centered on the production of a certain product.

I chose the hi-tech occupations by matching occupations most likely to be associated with the highest and most cutting edge skills. This estimation is, unfortunately, none too fine an indicator of these high-tech jobs, as it is defined according to the skill-set and title of the worker and nothing is known of the project the worker is engaged in. However, I hypothesize that respondents employed within these cutting-edge positions will have a unique relationship to my

[13] Other occupation dummy variables, including dummies for "lesser-skilled" occupations as well as "standardized" occupations including repair and keyboarding work were explored and found insignificant in all models. Occupations included in the "high-tech" dummy are found in Appendix C.

[14] The average shelf life of an IT product is nine to 18 months; three months for an internet product (Nguyen 1999).

dependent variables of interest. Contrary to the general positive relationship between educational attainment and core jobs, I propose that the respondents within these particular elite positions will be more likely to be contingently employed due to the expansion of "turn-over" jobs within hi-tech IT industries. Though confined to contingent sectors, I further hypothesize that the high demand for these workers will ensure that hi-tech workers enjoy benefits despite their temporary status and higher wages than those in other H-1B occupations. Hi-tech workers can perhaps be understood as the lucky few with the "good" contingent jobs as defined by Kalleberg (2000), Chris Tilly (1996) and others.

Descriptive Statistics

Weighted descriptive statistics, adjusted for both the full and wage samples, for all variables used can be found in Table 2 below. The first panel represents the full sample used for the contingency analysis and the second the reduced sample including wage information[15].

[TABLE TWO HERE]

Most of the descriptive statistics for both samples are very similar, giving some reassurance that the wage analysis will be representative of the entire population. The major difference between the two sample lies in the proportion of each survey year; for some reason the wage sample of H-1B occupations in 2001 is very small, constituting only 16% of the sample.

The rest of our statistics are to be expected, given our high-skilled population. There is even distribution amongst the sexes, with a little over 60% of the samples married with spouse present. Average years of education is 15 years, with about 18% holding a high school degree or less, 30% with some college or an associates degree, 33% holding a bachelors, 13% with a masters degree, 1% with a professional degree, and 4% with a PhD. I use individuals with a high

[15] The sample for the fringe benefits is smaller than the full sample (N=16,946), but the summary statistics were largely indistinguishable.

school degree or less as my omitted category in all models except for the wage analysis. The average years of labor force experience is 18 years. The average number of years since immigration is 2 years. Two percent of the sample falls into the less than five year, 5-10 year, and 10-15 years since immigration category, with those who immigrated 16 years or more capturing 7% of the samples. Respondents in the "high-tech" industry make up 23% of my sample, revealing their strong presence in H-1B occupations. Finally, the dependent variables of interest are typical for a workforce of higher skill levels. Contingent workers comprise only 6% of the sample, whereas 8% of the general US Civilian Labor Force is contingently employed, and while 85% of my samples are eligible for employer healthcare, only 64% of the general population is eligible. Almost three quarters of H-1B samples are eligible for retirement benefits, whereas a mere 52% of the general population is eligible for such benefits. About 75% of the sample is eligible for both benefits. Finally, the average weekly wage for H-1B occupations is $572.[16]

Analysis

Contingent Status

The purpose of the first analysis is to determine whether or not temporary immigrants most likely to be H-1Bs are disproportionately contingently employed, net of other demographic explanatory variables. Contingent status is a strong indicator of the turn-over pool, and will be included as an explanatory variable in each of the other models. If recently arrived skilled immigrants are more likely to be found in contingent occupations, the hypothesis of categorical overlap is supported. If contingent status and recently arrived immigrant status then predicts

[16] Computed by exponentiating the mean logged wage.

important outcomes such as fringe benefits and wages, the hypothesis that H-1Bs occupy a unique (and unequal) position within the US labor market will be supported.

To isolate and estimate the effects of my independent variables on a binomial outcome (contingent/core), I use logistic regression. My analysis begins with model selection. In order to determine what effect, if any, my independent variables provide in addition to the standard controls, I first determine whether or not they each significantly improve the fit of the model. The first model includes all the control variables: year of survey, education, sex, marital status, experience, and experience squared. The second model includes these variables plus year of immigration dummies and the high tech dummy. Finally, model three includes model 2, adding all the foreign degree-educational category interactions. The results of this model fitting are seen in table 3 below. According to adjusted Wald tests, model 2 fits significantly better than model 1. Model 3, however, does not significantly improve the fit of model 2. I thus conclude that years since immigration and "high-tech" employment are significant predictors of contingency, as hypothesized, and choose model 2 as my preferred model.

[TABLE THREE HERE]

The variables interacting foreign degree completion with education proved insignificant at the .05 level, and thus any conclusions drawn from them are tentative at best. Still, I include the coefficients for model 3 in table 4 below and briefly discuss the interaction effects, because it is important to note that differential returns on education do largely mitigate the effects of years since immigration. I then discuss the full results for model 2.

[TABLE FOUR HERE]

The first panel of table 4 displays the results of Model 2, regressing contingent worker status on all of the control and independent variables outlined above. Model 3, in the second

panel, includes all of these, plus an interaction variable between educational credentials and completion of education at a foreign institution. At face value, the interaction variables suggested considerable differences on educational returns for graduates of foreign schools, compared to those who finished their schooling in the United States. Even among the very highly educated, those with a foreign professional and doctoral degree are more likely to be contingently employed than the natives with only a high school degree, net of other variables in the model. This pattern was consistent, besides foreign masters and high school degrees. Net of other variables, immigrants with a foreign masters, though more likely to be contingently employed than a worker with a US masters, were less likely to be contingent than a respondent with a native high school degree. Also, a foreign high-school degree resulted in a lower likelihood of contingent employment, as compared to a native high school degree and net of other variables in the model.

Describing the effects of these interactions in odds is not as intuitive as showing the predicted probabilities of differing groups. Table 5 shows the probability of contingent employment amongst different groups, varied across education with all other control variables set at their mean values. It is clear that recently arrived immigrants with foreign degree completion are much more likely to be contingently employed than the rest of the groups, net of the other variables in the model. There is little variation in the predicted probability of contingent employment amongst the recent foreign versus native born who are educated in the US, as well as among later immigrants and the native born. Recently arrived immigrants with a foreign degree, those most likely to be H-1Bs, clearly are disproportionately engaged in contingent work.

It is also interesting to observe the considerable decrease in the years since immigration variables after including the education interactions, suggesting that some of the likelihood for

contingency explained by years since immigration is accounted for by differential returns to education credentials. However, all the interactions are insignificant according to the standard errors, and an adjusted Wald test of the six interaction variables together suggests the additive model 2 as the preferred model (Chi^2 with six degrees of freedom=1.77)[17].

[TABLE FIVE HERE]

The preferred model in the first panel of table 4 will now be discussed at greater length. The results of most of the control variables are significant and in the expected direction. Regarding the effects of education, the odds of contingent employment for those with a college or a masters degree were both significantly less than those with a high school degree. The other educational categories were not significant, though this is likely due to the smaller numbers of such individuals in the sample. The effects of attaining some college or an associates degree is associated with a 22% increase in the odds of contingent employment, as compared to those with a high school degree and net of other factors in the model. This suggests that college without the four-year completion has little meaning in terms of propensity for contingent work; such workers are even more likely than the high school educated to be employed contingently. Obtaining a college degree represents a major break in the likelihood for contingent employment, experiencing 34% less odds of contingency than the high school educated, net of other variables in the model. Higher education levels such as a masters, professional, or doctoral degree all likewise decrease the odds of contingent employment, as compared to high-school educated respondents and net of other factors in the model, though only masters degree proved significant. This is consistent with the definition of contingent jobs as "bad-jobs" reserved largely for the lesser skilled within their industries. Even at upper levels, a distinctive peripheral class of lesser

[17] The use of personal weights in the logit analysis prohibits the use of likelihood ratio model testing. Thus, Wald tests were used.

skilled jobs can be observed, and it is exactly these individuals who generally are excluded from the promotion possibilities reserved for the command and promotion class (Tilly 1998, Prasad 1998, Kalleberg 2000). Lower level jobs generally entail lower skill levels, as such work is less autonomous and more standardized (Prasad 1998), more project specific and narrow in scope, and requires less firm-specific knowledge to complete (Tilly 1998).

The other control variables in the model included sex, years experience, experience squared, marital status and year of survey. Surprisingly, the odds of contingent employment do not differ significantly for men than for women, net of other explanatory variables in the model. This is at odds with much of the literature on contingent employment, but could stem from the way that I have defined contingent status. Women might be more likely to be employed contingently due to family constraints, but I have excluded workers who are contingent of their own choice. Experience is significantly associated with contingent status, such that each year of experience decreases the odds of contingent employment by 10%, net of other factors in the model. The very small, but highly significant positive coefficient for experience squared belies the diminishing returns to experience at high levels. Being married with a spouse present is significantly associated with contingent status, resulting in a 40% decrease in the odds of being contingently employed. The lack of stability and precariousness of employment undoubtedly make contingent employment an unattractive choice for families. Finally the coefficients for each survey year after 1995, the omitted category, are all negative. This means that net of demographic, industry, and immigration effects, the probability of contingent employment diminished from the mid-1990s to 2001. This makes sense, as this time period is characterized by strong and steady growth in the H-1B industries (see Figure 1).

[FIGURE ONE HERE]

Most important to this analysis is the effects of immigrant status and employment within the hi-tech industry on contingent employment. Both are highly significant and in the expected directions. Recently arrived immigrants (5 years or less) experience 94% greater odds of contingent employment than do the native born, net of other factors in the model. But once immigrants have been in the U.S. for more than five years, they are no different from natives in the odds of contingent employment. This provides support for hypothesis 1 that the government-sponsored categorical distinctions of the H-1B visa "match" the needs of firms for periphery workers. The explicitly temporary structure of the H-1B visa, the dependency of the H-1B on their employer to remain in the US, and the symbolic "otherness" of recently arrived immigrants all contribute to their utilization in turn-over jobs. Prior research which has focused on wage differentials and unemployment rates has missed this important aspect of the logic of H-1B recruitment; perhaps the highly-skilled, temporary, and recently educated H-1Bs are needed to maximize the flexibility needed for these unstable industries.

More evidence of unstable industries can be found in the significant and positive association between "hi-tech" industries and contingent employment; hi-tech workers experience 61% greater odds of contingent employment than other H-1B industries, net of other explanatory factors in the model. As elaborated before, these occupations require some of the most cutting edge skills, and it is these very skills and the general youthfulness of those who possess them that creates increased mobility. The employers thus respond to such instability by expanding their peripheral workforce. Hypothesis 2 is supported by these findings.

A more intuitive representation of the effects of peripheral work on contingent employment is found in the bar graph in Figure 2, which displays the probability of contingent employment amongst differing groups from the preferred additive model, with all other variables

set at their mean. The predicted probability of contingent employment for recently arrived immigrants is almost twice that of natives in H-1B occupations, net of other factors in the model. Being in hi-tech industries is also a strong determinate of contingent status for both natives and recently arrived immigrants, such that the likelihood of contingent status nearly doubles for both groups when employed in hi-tech industries.

[FIGURE TWO HERE]

Fringe Benefits

Ineligibility for fringe benefits such as healthcare and retirement plans is what often separates "good" contingent work from "bad" contingent work (Tilly 1998; Kalleberg 2000; Conroy 1997). Is the greater probability of contingent labor observed amongst recently arrived immigrants a sign of inequality or simply high volatility and demand? To assess what effects the external categories of temporary immigrant and contingent worker have on fringe benefits, I regress eligibility for health insurance and retirement benefits from the primary employer on my control and independent variables.

To begin, I first had to make alterations due to the fact that complete information on retirement and health benefits was missing for approximately 25% of the sample. To preserve cases, I coded those who answered "Don't know" on retirement and healthcare questions as "No." This decision stems from an assumption that an employed adult would know if healthcare was offered, and if information on offered healthcare is so poor that an employee would be unaware of it, it may as well not exist. Those who refused to answer, gave no response (28 cases), or were not asked the questions were dropped from the analysis. This results in a reduced sample size of 16,946 who had complete or recoded information on all retirement and healthcare benefits within H-1B occupations. However, as the descriptive statistics on all explanatory

variables were virtually indistinguishable from that of the full sample there should be no complications from this.

To isolate and estimate the effects of my independent variables on a categorical outcome, I use multinomial logistic regression. The logged betas for this model are the logged odds of observing either a) healthcare, b) retirement, or c) both, relative to the logged odds of observing neither benefit. These coefficients are then exponentiated to represent incremental changes in the odds of eligibility for benefits as opposed to total ineligibility, dependent on a one unit increase in the independent variable.

[TABLE SIX HERE]

The results of my model are in table 6. Most of the control variables are significant and in the expected direction. Regarding the effects of education, the odds of receiving retirement, health care, or both as opposed to no benefits are almost all positively associated with increasing levels of education. This relationship is most pronounced comparing no benefits with full (both retirement and healthcare) benefits; respondents with a college degree experience over two and a half times greater odds of receiving full benefits (rather than no benefits) than do those of our omitted category with a high school degree, net of other factors in the model. Respondents with a masters, professional, or doctoral degree experience 3, 3 and a half, and over 5 times greater odds of full benefits (rather than no benefits), respectively, when compared to high school graduates and net of other factors in the model. All of these relationships are significant at well beyond the .05 level. Besides this general trend, however, there a few more interesting relationships to note.

The first is that the relationship between education and healthcare only is not as pronounced as that between education and full benefits. This makes sense if we consider the

demand for workers capable of H-1B occupation work, such that even those with the least formal education would be provided healthcare. Another notable detail is that the effects of having an associate degree or some college on all benefits are insignificantly different from having high school degree or less, net of other variables in the model. Evidently, the benefits of increased educational achievement do not begin until the B.A. in this case.

The other control variables in the model included sex, years work experience, experience squared, marital status and year of survey. The odds of eligibility for healthcare and both benefits are much greater for men than for women, net of other factors in the model; as compared to receiving no benefits, men have fully twice the odds of receiving both benefits and experience 49% greater odds of eligibility for healthcare. Though the male coefficient for the retirement only category is negative, it is small and insignificant. Men are more likely to be eligible for benefits across the board, net of other variables in the model.

These surprising results can be explained by the larger proportion of women working less than 35 hours a week; 78% of respondents reporting less than 35 hours a week (N=1,495) are female. Adding a dummy variable for working less than 35 hours a week significantly reduces the differences between the sexes in the odds of all benefit outcomes, relative to having no benefits: after controlling for part-time work in addition to the other control variables, men experience 18% greater odds of healthcare only, the same odds of retirement only, and 46% greater chances of both. While the male advantage in eligibility for healthcare remains, it is diminished by parsing out the effects of part-time employment. As the addition of this variable left all other coefficients substantively unchanged, it was not included in the model reported in table 6.

Experience is significantly associated with eligibility for benefits, such that each 5 year incremental increase in experience increases the odds of healthcare by almost a third (exp(.058*5)=1.34), and the odds of eligibility for both benefits almost doubles (exp(.138*5)=1.99), net of other factors in the model. The very small, but highly significant negative coefficient for experience squared belies the diminishing returns of experience at high levels. Finally the coefficients for each survey year after 1995, the omitted category, are inconsistent and insignificant except for 2001. The odds of eligibility for retirement benefits only, or both benefits as compared to no benefits, were significantly greater in 2001 as compared to 1995. Given that the expansion of the H-1B industries was at its zenith during this year (refer to figures 1 above), employers offered the best packages possible to attract skilled workers.

Most important to this analysis is the effects of immigrant status and employment within the hi-tech industry on eligibility for benefits. The first notable relationship is the absence of an expected correlation; immigrant status and employment within the high tech industry are not significant predictors of the odds of having healthcare rather than no benefits. This could possibly be explained by the high skill level in my sample, such that 87% of my sample is eligible for healthcare. This more basic need is acknowledged as necessary for workers of this skill level.

Though the hypothesized relationship between healthcare and recently arrived immigrant status did not hold, I find support for hypothesis 3 regarding eligibility for retirement. Being a recently arrived immigrant as opposed to a native does significantly affect the odds of eligibility for retirement and both benefits; net of other factors in the model, being a recently arrived immigrant (0-5 years) is associated with an 88% decrease in the odds of retirement only eligibility, and a 66% decrease in the odds of eligibility for both benefits, as compared to natives

and relative to the odds of having no benefits. This inequality continues to be significant until 16 years or more since immigration; in contrast to the sharp drop in the odds of contingent employment after 5 years, the odds of both benefits and retirement only remain lower for immigrants well after their arrival. Though healthcare appears assured for most, immigrants are less likely to receive retirement or "full" benefits. Thus, both within and without the official "turn-over pool" of contingent work, immigrants exhibit turn-over characteristics well into their US labor experience.

Employment in the hi-tech industries also displays the expected relationship in hypothesis 4, such that workers in the hi-tech industry are more than twice as likely to receive retirement rather than no benefits at all, and 62% more likely to receive both benefits than workers in other areas of H-1B occupations. This makes sense according to the high demand for their labor as explained in the background section.

Though these results are interesting and serve to further substantiate the concept of overlapping categories, the real story to this model lies in contingent status. Being a contingent worker is associated with an 86% decrease in the odds of being eligible for healthcare, a 52% decrease in the odds for retirement, and 96% smaller odds than core workers of eligibility for both benefits, as compared to total ineligibility and net of other factors in the model. Obviously, there are qualitative differences in the working worlds of these two internal categories: employers accrue substantial savings on fringe benefits at the costs of these turn-over workers. Support for hypothesis 3 is found first in the fact that immigrants are less likely to be eligible for benefits, regardless of their contingent status, and the striking differences between contingent and core workers lend further credence to the notion of matching external categorical outsiders with internal categorical outsiders.

Wages

Experiencing lower wages than core workers performing similar work is another indicator of the periphery sector. Yet previous studies have observed a positive wage difference for the foreign born relative to native workers in skilled occupations (Espenshade and Udansky 1999, IT Workforce Project 2003). Indeed, a cursory glance at the earnings of the foreign born compared to natives in H-1B occupations reveals a statistically significant[18] earnings advantage of over 14%. Without introducing any controls, foreign born average $641 weekly whereas natives average $562 weekly earnings.

Naturally, comparing otherwise similar native and foreign born workers is more interesting, so the usual variables are introduced into the model in table 7. The first model is performed with a weighted OLS regressing logged wages on the education dummies, sex, years experience, experience squared, and marital status.

[TABLE SEVEN HERE]

All variables in Table 7 are significant at the.01 level and in the expected direction. As the dependent variable is in logged form, the coefficients are expressed as the effect of one unit change of the independent variables on the approximate percent change in the dependent variable. Education has a positive effect on wages, as each higher educational category experiences higher logged wages than the omitted category of high school or less. The other measure of human capital, years workforce experience, also has a positive association with logged wages, though the effect levels off at very high levels of experience as denoted by the negative square term. Being male is associated with 48% (exp(.396)) greater logged wages than a woman, and all else being equal, respondents married with spouse present earn 9% higher logged wages than do other respondents.

[18] T-test difference in earnings between 2 groups: 3.55

The predictions of the model are as expected: human capital is positively associated with wages, and married men earn more than singles and women. Where this study departs from the literature is in the inclusion of categorical variables drawn from the segmentationalist perspective. This study seeks to expand on these predictors by examining what effects the *categorical membership* immigrant/non-immigrant and contingent/non-contingent has on wages within H-1B industries. In order to do this, I follow a simultaneous-equation model which both assesses the association between these memberships and wages as well as corrects for the effect of selectivity bias into contingent status on observed wages.

Following Lee's (1978) unionism and wage rates analysis, suggested by Lowell (2001), I assume that an endogenous process selects H-1B workers into and out of contingent employment, and contingent and core H-1B worker earnings are censored by unobservable latent variables influencing this selection process. Let I_i^* be a dichotomous variable equal to 1 if the worker *i* is observed in a contingent work situation and 0 otherwise. Contingent worker earnings for individual *i* (E_i^c) are observed ($E_i^c>0$) if and only if the individual is selected into contingent employment. Conversely, core worker earnings ($E_i^{nc}>0$) are observed if and only if the individual is selected into core employment ($I_i^*=0$). Thus, two separate wage equations are being estimated; one for contingent workers and one for non-contingent workers.

The regression results in table 6 indicate that individual level factors are important predictors of wages, but the focal independent variables of this study are membership within internal and external categories that might shape earnings apart from individual productivity. I propose that, due to the stipulations of the H-1B visa that guarantees equal wages for immigrants, immigrant status may affect selection into contingent work independent of its effect on earnings.

Thus the modeling takes part in two steps: first, a probit model is used to estimate the probability of contingent employment given the explanatory variables outlined in the logistic regression (table 2) analysis above. Two ratios (Mills ratios) are then obtained from this equation, and are used to assess possible selectivity bias through correlation of error terms:

1) Contingent: $E(u_i^c/I_i = 1) = -\phi(I_i)/\Phi(I_i)$
2) Core: $E(u_i^{nc}/I_i = 0) = (1-\phi(I_i)/\Phi(I_i))$

Where ϕ and Φ are, respectively, the normal density and distributive functions, both evaluated at I_i, the probit indicator function given by the same parameters as the logistic equation. The Mills ratios are then included in two separate wage equations: contingent worker and core worker weekly earnings. The results of these two regressions are found in Table 8 below.

[TABLE 8 HERE]

After controlling for selectivity into contingent occupations, the control variables continue to have similar effects as in the regular OLS model. Experience, education, and being male are all significant and positively associated with weekly income, net of other variables in the model, for both contingent and core workers. Experience squared has a small but significant negative effect on wages. An unexpected, though interesting, finding from conducting two separate wage regressions is the different effect of survey year on contingent and core wages. All the later survey years differ insignificantly from 1995 in the contingent wage regression, implying that there was little or no nominal wage growth during the "boom" years for these workers. Amongst the core workers, the coefficients for all three later survey years are positive, signifying that wages grew from 1995. While only survey year 1999 is significant at the .05 level, is was associated with a 12% increase in wages. This suggests that while wages improved during the late 1990s for core workers, contingent workers did not enjoy this wage growth.

Furthermore, with all other factors set at their means, contingent workers in H-1B occupations earn on average $397 (exp(3.924)), as compared to $589 (exp(4.31)) weekly for core workers. This provides strong evidence for hypothesis 5: contingent workers, immigrant or not, earn far less than their core counterparts.

Inequality between contingent and core workers is evident in the wage differences between the two groups. Controlling for the internal core/contingent dichotomy completely eliminates the effect of immigrant status; years since immigration is not significantly different from 0 (or native) for either wage regression. This supports the hypothesis that while H-1Bs earn the prevailing wage, they are exploited through overrepresentation within internal "turn-over" categories, which do have consequences for wages.

Employment within a hi-tech occupation displayed unexpected effects on wages. I had hypothesized that, net of other factors, workers in high demand hi-tech industries would receive higher wages. For contingent workers, this does not turn out to be the case; instead, amongst the contingently employed, the wages of working in a hi-tech industry do not differ significantly from wages outside of hi-tech, net of other factors in the model. Amongst core workers, hi-tech employees earned 14% more than workers outside of hi-tech, net of other factors in the model. This result was somewhat surprising, as due to the demand for hi-tech workers and the greater benefits they are eligible for, I expected to see correspondingly higher wages in both the contingent and core sectors.

Conclusion

This paper studied the labor market position of H-1Bs, utilizing three indicators of inequality drawn from the segmentationalist perspective. The first analysis revealed that recently arrived immigrants were more likely to be employed contingently, net of the traditional

measures. Workers in "hi-tech" occupations were also more likely to be found in contingent employment. This supports the first two hypotheses: 1) external categorical outsiders (H-1Bs) are "matched" with internal categorical outsiders (contingent jobs), and 2) the more instability in a field (hi-tech), the greater the likelihood of contingent employment. It also provides the first clue into the demand for high skilled immigrants; while the analysis here cannot speak directly to the motives behind H-1B recruitment, the fact that these immigrants tend to be contingently employed lends credibility to the argument that they serve to fuel an expanding encroachment of "bad jobs" within high-skilled industries.

The second analysis lends further support to this conceptualization. First, regardless of employment in core or periphery sectors, recently-arrived immigrants are less likely to be eligible for retirement and full benefits. Second, whether immigrant or native, contingent workers are also much less likely to be eligible for benefits. Obviously, employers save money both by recruiting outsiders and by expanding their internal turn-over labor pool. Supply and demand still functions, however, for when the market is tight enough, as in the case of hi-tech workers, benefits are still offered.

The final indicator of bad jobs, lower wages, receives mixed results in this paper. Outside of their overrepresentation in contingent work, recently arrived immigrants earn the same as natives. This is probably due to government interference, as a major stipulation of the H-1B visa is equitable wages. Contingent workers earn less than comparable core workers, however, and did not experience the same wage growth in the late 1990s as core workers did. This lends further support to conceptualizing contingent jobs as bad jobs, even at high skill levels.

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TABLES

Table 1. Definitions of Contingent Labor: Coincidence between categories of contingent labor and definitions of contingency

	Definitions			
Employment Types	(1): Uncertain Duration	(2) Weak Attachment	(3) "Secondary" Characteristics	(4) H-1B Industry Turnover Pool
Workers hired through temporary employment agencies	Most	All	Most	All
Direct hiring into temporary or project work	All	All	Some	All
Part-time workers	Few	All	Most	None
Self-employed workers	Few	All	None	None
Contract workers	Most	All	Some	Most
Contingent worker for personal reasons	All	All	Few	None
Informal Workers	All	All	All	None

*Adapted from Cornoy et al 1997

Table 2. Weighted Descriptive Statistics of the US Civilian Labor Force in H-1B Occupations, 1995-2001

Variable	Full Sample		Wage Sample	
Control	Mean/% Positive	Std. Error	Mean/% Positive	Std. Error
1995 CPS	23%		26%	
1997 CPS	24%		28%	
1999 CPS	26%		29%	
2001 CPS	27%		16%	
Male	52%	.005	51%	.008
Married with Spouse Present	62%	.005	63%	.008
Years of Education	15.05	.022	15.1	.042
High-School Educated	18%	.004	18%	.006
Some College or Associates	30%	.004	29%	.008
Bachelor of Arts or Science	33%	.004	33%	.008
Masters	13%	.003	14%	.005
Professional Degree	1%	.0009	1%	.0002
Doctorate	4%	.002	5%	.003
Years of Labor Force Experience	18.34	.106	18.22	.2
Independent				
Years since Immigration	2.27	.069	2.25	.123
5 Years or Less Since Immigration	2%	.001	2%	.002
6-10 Years "	2%	.001	2%	.002
10-15 Years "	2%	.001	2%	.002
16 Years or More "	7%	.002	7%	.004
Hi-Tech Industry	23%	.004	22%	.007
Dependent				
Contingent Worker	6%	.002	6%	.005
Eligible for Employer Healthcare	85%	.006	85%	.007
Eligible for Employer Retirement	73%	.008	73%	.008
Eligible for Both	76%	.009	75%	.009
Weekly Earnings, Dollars			572.49	89.92
	N=19,421]		[N=4,472]	

Table 3. Goodness of Fit Statistics for Various Models Predicting the Propensity towards Contingent Labor, US Civilian Labor Force in H-1B Occupations, 1995-2001 (N=19,421).

	F	d.f.(1)	d.f.(2)	p
Models				
(1): Control Variables	19.47	12	19,409	.000
(2): (1) + Year of Immigration & Hi-Tech Dummy	15.9	17	19,404	.000
(3): (2) + Education Interactions	12.48	23	19,398	.000
Contrasts	F	d.f.(1)	d.f.(2)	p
(2)-(1)	7.26	5	19,404	.000
(3)-(2)	1.77	6	19,398	.100

Table 4. Weighted Logistic Regression of Contingent Status with and without Education interactions on Control and Dependent Variables, U.S. Civilian Labor Force in H-1B Occupations1995-2001 [N=19,421]

Independent Variable	b	Std. Error	p	e^b
Model 2: Preferred Model				
Controls				
Male	.04	.092	.650	1.042
Experience	-.1	.009	.000	.904
Experience Squared	.001	.0002	.000	1.001
Education (High School Omitted)				
Some College/Associates Degree	.201	.1307	.124	1.222
College Degree	-.419	.142	.003	.658
Masters	-.488	.173	.005	.614
Professional Degree	-.042	-.042	.914	.959
PhD	-.469	-.469	.084	.625
Married with Spouse Present	-.508	.055	.000	.601
Survey Years (1995 Omitted)				
Survey Year 1997	-.046	.108	.682	.955
Survey Year 1999	-.07	.106	.538	.932
Survey Year 2001	-.244	.102	.062	.783
Independent				
Immigration (Native Born Omitted)				
5 or less years since immigration	.661	.482	.008	1.94
5-10 years since immigration	.138	.304	.603	1.15
10-15 years since immigration	-.644	.23	.141	.525
16 or more years since immigration	-.156	.165	.417	.855
Hi-tech employment	.478	.166	.000	1.613
Model 3: Foreign Degree Interactions				
Controls				
Male	.038	.096	.676	1.04
Experience	-.1	.009	.000	.904
Experience Squared	.002	.0002	.000	1.001
Education (High School Omitted)				
Some College/Associates Degree	.160	.133	.228	1.173
College Degree	-.454	.145	.002	.635
Masters	-.463	.179	.009	.629
Professional Degree	-.300	.449	.504	.741
PhD	-.623	- .623	.034	.536
Married with Spouse Present	-.515	.091	.000	.597
Survey Years (1995 Omitted)				
Survey Year 1997	-.043	.109	.703	.958
Survey Year 1999	-.071	.106	.531	.931
Survey Year 2001	-.251	.102	.055	.778
Independent				
Immigration (Native Born Omitted)				
5 or less years since immigration	.366	.424	.214	1.44

5-10 years since immigration	-.071	.28	.813	.931
10-15 years since immigration	-.835	.196	.064	.434
16 or more years since immigration	-.253	.162	.225	.777
Hi-tech employment	.479	.167	.000	1.615
Interactions				
High School*Foreign Completion	-.556	.434	.463	.574
Some College*Foreign Completion	.82	.756	.014	2.272
College*Foreign Completion	.382	.43	.193	1.465
Masters*Foreign Completion	-.029	.363	.939	.972
Professional*Foreign Completion	1.194	2.93	.179	3.301
PhD*Foreign Completion	.863	1.46	.162	2.37

Table 5. Predicted Probabilities of Contingency amongst Immigrants and Native Born by Education Level and Foreign Completion, US Civilian Labor Force in H-1B Occupations, 1995-2001 [N=19,421]

	Predicted Probability of Contingent Employment					
Group	High School	Some College	College	Masters	Professional	PhD
Recently Arrived* Foreign Born, Foreign Educated	3%	16%	8%	6%	15%	10%
Recently Arrived Foreign Born, U.S Educated	4%	5%	3%	3%	3%	3%
Later Foreign Born, Foreign Educated	1%	6%	2%	2%	5%	4%
Later Foreign Born, U.S. Educated	3%	4%	3%	3%	2%	2%
Native Born	4%	5%	3%	3%	3%	3%

*5 years or less

Table 6. Effect Parameters for a Model of the Determinants of Healthcare and Retirement Benefits, US Employed Adults 1995-2001 (Std. Errors in parantheses)

Variable	Healthcare	Retirement	Both
Logits (b)			
Survey Year 1997 (1995 Omitted)	.103	.059	.019
	.097	.175	.082
Survey Year 1999	-.169	.193	.068
	.099	.173	.082
Survey Year 2001	.134	.426	.368
	.113	.188	.095
Male	.395	-.061	.701
	.080	.139	.067
Education (High School Omitted)			
Some College/Associates	-.126	.140	.123
	.099	.177	.081
College	.413	.521	.983
	.115	.213	.099
Masters	.490	1.058	1.165
	.158	.238	.135
Professional Degree	.369	.609	1.257
	.504	.851	.427
Doctoral Degree	.503	.970	1.673
	.343	.434	.288
Experience	.058	.064	.138
	.010	.017	.009
Experience Squared	-.001	-.001	-.003
	.000	.000	.000
Immigrant Status (Natives Omitted)			
0-5 Years since Immigration	.144	-2.139	-1.093
	.251	.628	.246
5-10 Years since Immigration	.047	-1.095	-.747
	.249	.582	.233
10-15 Years since Immigration	.129	-1.396	-.831
	.241	.773	.220
16+ Years since Immigration	-.096	-.408	-.182
	.164	.304	.137
Hi-tech Industry	.061	.832	.479
	.125	.171	.103
Contingent Status	-1.936	-.728	-3.257
	.166	.229	.144
Odds Multipliers e^b			
Survey Year 1997 (1995 Omitted)	1.108	1.060	1.019
Survey Year 1999	.844	1.213	1.070
Survey Year 2001	1.143	1.531	1.445
Male	1.485	.941	2.016
Some College/Associates	.882	1.150	1.131
College	1.511	1.684	2.671
Masters	1.632	2.881	3.207

Professional Degree	1.446	1.839	3.515
Doctoral Degree	1.653	2.637	5.330
Experience	1.059	1.066	1.148
Experience Squared	.999	.999	.997
0-5 Years since Immigration	1.155	.118	.335
5-10 Years since Immigration	1.048	.335	.474
10-15 Years since Immigration	1.138	.247	.436
16+ Years since Immigration	.908	.665	.834
Hi-tech Industry	1.063	2.299	1.615
Contingent	.144	.483	.039
[N=16,946]			

Table 7: Weighted OLS Regression of Logged Wages on Traditional Variables, US Civilian Labor Force in H-1B Occupations, 1995-2001 [N= 4,472]

Variable	Coefficient	Std. Error
Some College or Associates Degree (High School Omitted)	.096	.036
College Degree	.479	.037
Masters Degree	.487	.049
Professional Degree	.669	.117
Doctoral Degree	.672	.058
Years Workforce Experience	.06	.004
Experience Squared	-.001	.00008
Male	.396	.026
Marital Status	.09	.025
Intercept	5.248	.051

Table 8. Selectivity Corrected Estimates of Contingent and Core Worker Log Weekly Earnings Equation, US Civilian Labor Force in H-1 B Occupations, 1995-2001

	Contingent		Core	
Variable	Coefficient	Std. Error	Coefficient	Std. Error
Survey Year 1997	-0.111	0.171	0.042	0.027
Survey Year 1999	0.231	0.17	0.118	0.026
Survey Year 2001	-0.394	0.561	0.075	0.051
Years of Education	0.191	0.052	0.083	0.083
Years of Workforce Experience	0.086	0.026	0.055	0.004
Experience Squared	-0.001	0.0005	-0.001	0.00008
Male	0.409	0.121	0.403	0.025
Married with Spouse Present	-0.032	0.632	0.089	0.025
Years Since Immigration	-0.0003	0.008	0.002	0.001
Hi-tech	.066	.171	.143	.033
Mills Ratio	-0.865	0.615	0.002	0.005
Intercept	3.924	0.658	4.31	0.093
	[N=310]		[N=4,162]	

FIGURES

Figure 1.A: All Employees (in thousands) in Computer Design and Related Services, February 1995-2001

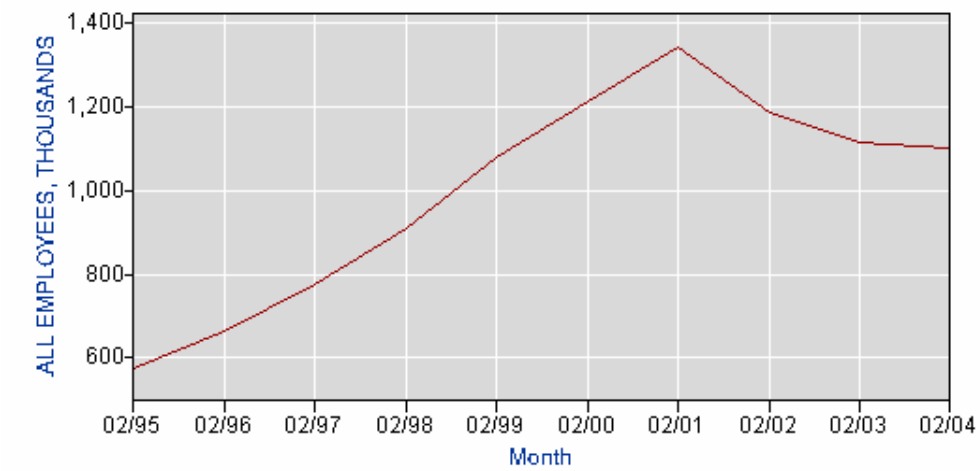
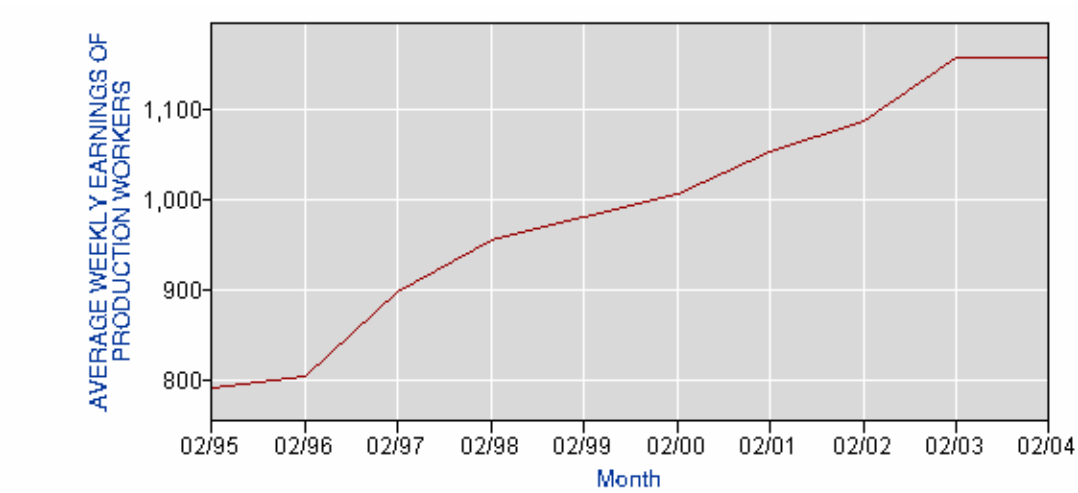
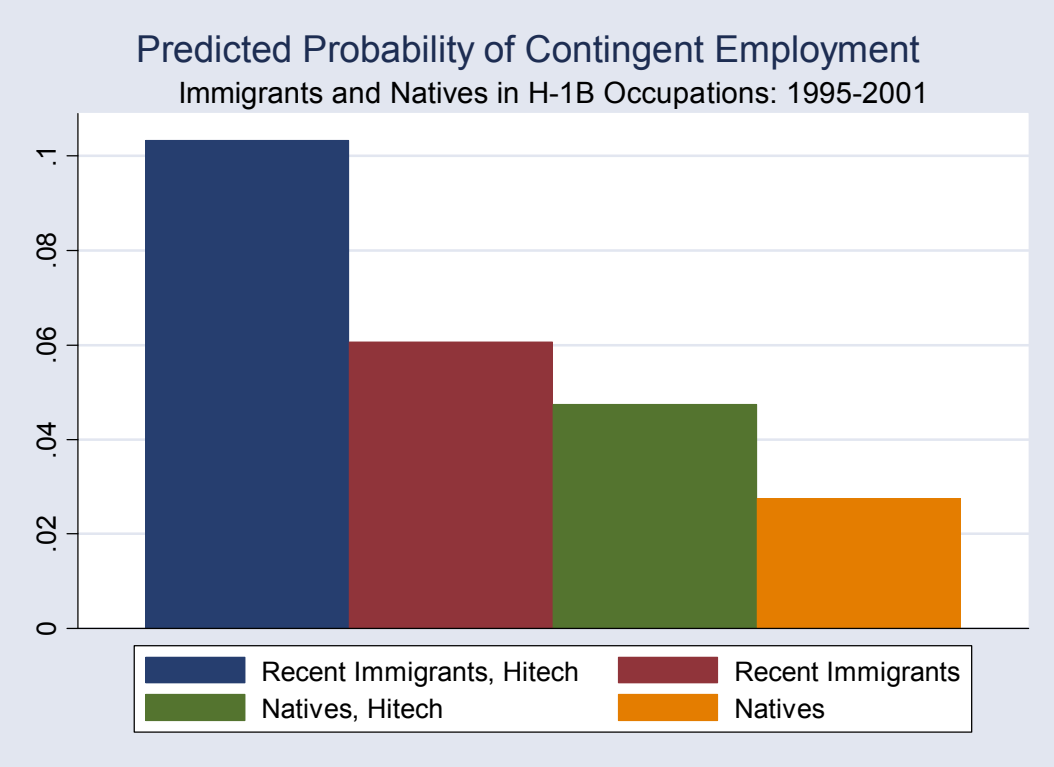


Figure 1.B: Average Weekly Earnings in Computer Design and Related Services, February 1995-2001



Source: National Current Employment Statistics Survey, accessed online through on-demand data retrieval at http://www.bls.gov/data/home.htm#tools

Figure 2: Predicted Probabilities of Contingent Employment amongst Recently Arrived Immigrants (5 years or less) and Native Employed Workers in H-1B Occupations, 1995-2001



Appendix A: H-1B Occupations

Top 10 Recruitment Occupations for H-1Bs:	CPS Occupation Descriptions
Computer Related (with 65% of these computer systems design and related)	Mathematical and Computer Scientists, Computer Programmers, Supervisor: computer equipment operator, Chief communications operators, Computer Equipment Operators, Communications equipment operators, Statistical Clerks, Electrical and Electronic Repairers
Architecture, Engineering, Surveying	Engineers, Architects, Surveyors, Engineering and Related technologists and technicians
Administrative Specializations	Management Related Occupations
Education (with 67% of these college/university level)	Post-secondary teachers, social scientists
Medicine and Health	Managers, Medicine and Health
Managers and Officials	Management Analysts, Management Related Occupations
Life Sciences	Natural Scientists
Social Scientists	(see education)
Math and Physical Scientists	(see life sciences)
Miscellaneous Professional	Management Related Occupations, n.e.c. (see managers and officials)

Appendix B: Years Since Immigration Recode

Immigrant's year of entry was coded in consistent categories across all survey years until the more recent year of immigration categories, starting with 1992. At this point the categories differed according to survey year, as can be seen in the table below.

Year of Entry

Code	Survey 1995	Survey 1997	Survey 1999	Survey 2001
13	1992-1995	1992-1993	1992-1993	1992-1993
14	-	1994-1997	1994-1995	1994-1995
15	-	-	1996-1999	1996-1997
16	-	-		1998-2001

The first step in my recode was assigning consistent year of entry categories. This was accomplished by creating a new set of codes for 13-16, where only those categories of the same year range were grouped together. This resulted in the codes in the table below. Random numbers from 0 to 1 were then generated for each respondent in each newly created category. A single year of entry was then assigned to each subset of random numbers within each category. When 4 years fell in a category (13, 14, 15, 16), each year was assigned to random numbers 0-.25, .25-.5, .5-.75, .75-1. When two years fell in a category (13_2, 14_2, 15_2) each year was assigned to random numbers 0-.5 and .5-1.

Year of Entry

Code	Survey 1995	Survey 1997	Survey 1999	Survey 2001
13	1992-1995	-	-	-
13_2	-	1992-1993	1992-1993	1992-1993
14	-	1994-1997	-	-
14_2		-	1994-1995	1994-1995
15	-	-	1996-1999	
15_2	-	-	-	1996-1997
16	-	-	-	1998-2001

Appendix C: "Hi-tech" Occupations

Mathematical and computer scientists:
Computer Systems Analysts and Scientists
Operations and Systems Researchers and Analysts
Actuaries
Statisticians
Mathematical Scientists

Natural Scientists:
Physicists and Astronomers
Chemists, except biochemists
Atmospheric and space scientists
Geologists and Geodesists
Physical Scientists, n.e.c.

Technologists and Technicians, except health:
Engineering and Related Technologists and Technicians
Industrial Engineering Technicians
Mechanical Engineering Technicians
Computer Programmers