

**Natives, the Foreign-Born and High School Equivalents:
New Evidence on the Returns to the GED**

Melissa A. Clark

Princeton University

David A. Jaeger

College of William and Mary

IZA

October 2001

Acknowledgements: The authors thank Ann Polivka, participants of the labor lunch at Princeton University and seminars at Hunter College and IZA for helpful comments.

Address: Clark: Industrial Relations Section, Firestone Library, Princeton University, Princeton, NJ 08540; email: maclark@princeton.edu. Jaeger: Department of Economics, College of William and Mary, P.O. Box 8795, Williamsburg, VA 23187; email: djaeger@wm.edu.

Abstract

In this paper we explore the labor market returns to the General Education Development exam, or GED, using data from the Current Population Survey. We examine how the return to the GED varies between U.S. natives and the foreign-born who received their formal education outside of the U.S. We find that the foreign-schooled with a GED earn significantly higher wages than both foreign-schooled dropouts and foreign-schooled high school graduates. This pattern stands in contrast to that for U.S. natives; among natives, GED recipients earn less than high school graduates, but more than dropouts. These effects for natives appear to become larger over the life cycle and do not seem to be due to cohort effects. While it is difficult to attach a purely causal interpretation to these results, they do indicate that the GED may be more valuable in the labor market, particularly for individuals whose formal schooling was obtained outside of the U.S., than some previous research suggests.

Keywords: GED, Immigration

JEL Categories:

The labor market returns to the General Educational Development exam, or GED, have been estimated to be small, casting doubt on the usefulness of GED as a credential for high school dropouts. Using a variety of data sources, this literature has typically found that GED recipients in their twenties and early thirties earn less than traditional high school graduates and are often estimated to fare little better than high school dropouts.¹ These findings are, in general, robust to the inclusion of a variety of simple controls for ability (e.g. Armed Forces Qualifying Test scores) and human capital accumulation (e.g. completed years of schooling) and cast doubt on the labor market equivalence of the GED and a traditional high school diploma.

There is some evidence, however, that GED recipients with relatively weak cognitive skills receive significantly higher annual earnings than observationally similar high school dropouts. Murnane, Willett, and Tyler (1999) found that individuals who performed poorly on a standardized test administered in 10th grade received a significant return to the GED credential, although individuals who had higher scores did not. Tyler, Murnane, and Willet (2000) utilized differing passing standards across states as a “natural experiment” to control for ability and other unobservables. They found that the GED played a significant and positive signaling role, increasing the earnings of low-scoring white dropouts by 10 to 19 percent, although they found that there were no significant effects for non-whites.

As a U.S.-specific credential, the GED may play a particularly important role for the foreign-born.² The literature suggests that the returns to credentials acquired in a migrant’s

¹ Cameron and Heckman (1993) use the NLSY to examine the return to the GED for men aged 25 and 28. Cao, Stromsdorfer and Weeks (1995) also use the NLSY and replicate this result for mothers aged 22 to 33. Murnane, Willett, and Tyler (1999) find similar results for 27-year-old men in High School and Beyond.

² Throughout the paper we refer to the “foreign-born,” rather than “immigrants.” This is to make clear the distinction between individuals who were born outside the U.S. (who can be identified in the Current Population Survey, the data used for our study), and immigrants, who come to the U.S. as legal permanent residents (who cannot be separately identified in the CPS). The foreign-born population includes individuals who are in the U.S. on a

destination country are generally higher than those obtained in his or her home country. Using the Israeli Census of Population, Friedberg (2000) finds that the returns to education received abroad are lower for most immigrant groups than for persons schooled in Israel, although the returns are higher for those emigrating from Western countries. Schoeni (1997), using the 1980 and 1990 U.S. Censuses, finds that, in general, the returns to education for foreign-born men who received some of their education in the U.S. are higher than for those who received all of their education outside of the U.S., although the returns for both groups are lower than those for natives. Similarly, Bratsberg and Ragan (1999), using data from both the 1990 U.S. Census and the National Longitudinal Survey of Youth, find that the returns to education, whether received in the United States or the source country, are greater for immigrants who have received at least some of their education in the United States. Their general findings are robust to the inclusion of controls for English-speaking proficiency and a proxy for ability (AFQT score) and suggest that even a small amount of U.S. schooling "upgrades or validates source-country education" (p. 24). Both the GED literature and the literature on foreign schooling suggest that the GED may have a positive impact on immigrants' wages, inducing the foreign-born to acquire U.S.-specific skills and/or signaling to employers that an immigrant possesses at least enough U.S.-specific skills to pass the exam.

In this paper we use new information on GED receipt from the Current Population Survey (CPS) to estimate the return to the GED for natives and for the foreign-born whose formal education was likely to have been earned outside of the U.S. We find that the relative returns to the GED are larger for the foreign-born than for natives. The foreign-born who possess a GED earn more than observationally equivalent migrants who received a traditional high school

temporary basis as well as those who may have entered the U.S. without a visa, or who have stayed longer than their visa would permit.

diploma outside of the U.S., who in turn earn more than dropouts. For natives we find that white high school graduates earn statistically significantly more than GED recipients who, in turn, earn statistically significantly more than high school dropouts. For native non-Hispanic blacks and native Hispanics, we find that the returns to traditional high school diplomas and GEDs are statistically indistinguishable from each other, but significantly more than for high school dropouts. While it is difficult to attach a purely causal interpretation to these results, they support Tyler, Murnane, and Willett's (2000) conclusion that the GED may play an important signaling role in the labor market. As a U.S.-specific credential, this role for the GED may be particularly important for the foreign-born whose formal education was earned outside of the U.S.

In section I, we briefly discuss the theoretical motivation in examining the returns to the GED. Section II discusses the newly available information on the GED in the CPS and our data. In Section III we present our estimates of the return to the GED, and in Section IV we compare our results to those of Cameron and Heckman (1993). We find that the effect of the GED grows larger over the life cycle and that, in comparison to Cameron and Heckman's estimates, this result does not seem to be driven by cohort effects. In Section V we offer some conclusions.

I. Motivation

There are several reasons why we might expect GED-holders who have completed no post-secondary education to earn higher wages than high school dropouts with the same number of years of schooling, and, in particular, why we might expect these earnings differentials to vary

between U.S. natives and the foreign-born who received all their formal schooling outside the United States.

First, individuals who take the GED might acquire significant levels of human capital in preparing for the exam and consequently increase their value to employers. Most previous studies dismiss this possibility, citing the fact that the median amount of time spent preparing for the GED exam is quite low (only 30 hours in 1989). Over 24 percent of test-takers spend more than 100 hours preparing for the exam, however, and it is at least possible that they appreciably increase their skills in the process, leading to higher wages than they otherwise would have earned (Boesel, Alsalam, and Smith, 1998). It is also possible that migrants schooled outside the United States spend significant amounts of time preparing for the exam (for example, learning English), and might, in the process, acquire meaningful levels of U.S.-relevant human capital. Depending on the degree of transferability of skills from formal education received outside the U.S., it is possible that foreign-schooled GED-holders might earn more than foreign-schooled high school graduates.

Second, the GED could operate as a signal to employers of greater productivity, allowing GED recipients to distinguish themselves from dropouts with similar years of schooling. If the GED does have a signaling effect, we might expect this effect to be more important for foreign-schooled GED-holders than for U.S. natives. As discussed earlier, there is some evidence that human capital acquired abroad is less transferable to the destination labor market than human capital acquired in the in the destination country. Additionally, while school quality is relatively similar across the United States, this quality may vary considerably from country to country, and a potential employer may be less familiar with the quality of education in other countries. For both these reasons, a recognized U.S. credential such as the GED could signal to employers that a

potential employee schooled abroad does have a certain level of U.S.-relevant skill. If the GED truly serves as a signal of U.S.-specific skills, we would expect foreign-schooled GED-holders to fare better in the labor market than the foreign-schooled who received a high school diploma outside the United States.

Ordinary least squares estimates of the returns to the GED may be biased, but the direction of the bias is indeterminate. The well-known omitted variables problem in estimating the return to education (Griliches 1977, Willis 1986, among many others) may induce a correlation between wages and GED receipt that is due solely to unobserved factors like motivation or ability and not to any causal effect of the GED on earnings. The CPS lacks traditional proxies for “ability” such as test scores or parental education, and our results may suffer from omitted variable bias. The direction of this potential bias is unclear, however. On the one hand, individuals who obtain a GED might simply be more motivated or possess higher (unmeasured) skill than high school dropouts. On the other hand, dropouts with greater abilities might have less use for an additional credential than those who opt to take the GED. The simple inclusion of test scores in previous studies (Cameron and Heckman 1993, Cao, Stromsdorfer and Weeks 1995; and Murnane, Willett, and Tyler 1999) did not greatly alter the finding that the GED had no significant effect on earnings. On the other hand, when more sophisticated strategies to controls for ability were employed, as in Murnane, Willett, and Tyler (1999) and Tyler, Murnane, and Willett (2000), the effects of the GED on earnings were found to be positive and significant. This suggests that our inability to control for ability might bias our estimates *downward*, and that any significant evidence of returns to the GED we find might in fact understate the true returns.

II. Data

Partially in response to the GED literature, in 1997 the Current Population Survey (CPS) began to differentiate between high school graduates who received their credential via a traditional diploma and those who were certified via the GED.³ Beginning in January 1997, individuals who reported that their highest degree received was a "high school... diploma or equivalent (GED)" were asked an additional question: whether they received this degree via graduation from high school or a "GED or other equivalent." GED recipients were also asked their highest level of education attained prior to receiving the GED. Prior to 1997, information on GED receipt was available in the CPS only from periodic supplements.

One major advantage of the new data from CPS is the large sample size — our sample is more than 20 times the size of those analyzed in most previous studies.⁴ In addition, the CPS began collecting information on the country of birth and citizenship status of respondents in 1994. Combined with the new information on the GED, the CPS is the only data set that we know of that permits an examination of the effects of the GED for the foreign-born. The CPS also permits the examination of a wider age range than in previous studies. We will utilize this feature of the data, combined with results from Cameron and Heckman (1993), to examine changes over the life cycle in the returns to the GED.

The primary disadvantage of the CPS relative to the data sets previously analyzed in the GED literature is that there are no data on test scores or family background, and hence no way to introduce controls for ability as many of the previous studies have done. As discussed above,

³ Public-use data on the GED are available beginning in 1998.

⁴ Tyler, Murnane, and Willett (2000) is a notable exception, although their primary source of data does not include information on traditional high school graduates.

however, the simple inclusion of test scores as a control for ability had virtually no effect on the results of previous studies. In addition, the CPS only distinguishes between traditional high school graduates and GED recipients if this degree was the highest degree attained. Among individuals who have completed some college or more, we are unable to differentiate between those who received a high school diploma and those who received a GED. While this does not bias our results, it does prevent us from exploring a separate set of interesting questions regarding the returns to the GED for individuals who go on to complete some post-secondary education.⁵

Our data are drawn from the CPS Outgoing Rotation Groups from January 1998 through May 2001.⁶ Our sample comprises 67,349 individuals with positive earnings between the ages of 25 and 65 who received a high school degree (either traditional or GED) or less. It includes both U.S. natives and the foreign-born, and we restrict the sample of foreign born to those who entered the United States after the age of 20. This restriction allows us to examine the returns to the GED for persons who most likely completed all their formal schooling outside the U.S, a group we term the “foreign-schooled.”⁷

⁵ See Boesel, Alsalam, and Smith (1998) for an overview of the literature on post-secondary outcomes of GED recipients.

⁶ The CPS outgoing rotation groups comprise individuals in their fourth and eighth month of the survey. The CPS is structured so that households are interviewed for four consecutive months, not interviewed for the next eight months, and then interviewed for four more consecutive months. In order to avoid having a particular individual appear in our sample twice, we use only individuals who are in their fourth month of the survey, except for the first year, when we take individuals who were in both their fourth and eighth months.

⁷ We also exclude American Indians, Aleuts, and Eskimos, Alaskans and Hawaiians, individuals who completed more than a high school education, individuals whose wages were less than \$1 or greater than \$200 an hour, and individuals who reported they were either self-employed or worked without pay in their main job. In addition, we exclude Canadians, as Canada also offers the GED and could confound our exploration of the returns to the GED as a post-migration credential.

Since 1992 the educational attainment question in the CPS has asked respondents for the highest level of school completed or degree received. For levels below 9th grade, the categories represent a range of grades. In order to obtain a linear measure of educational attainment (for use in calculating potential labor market experience and in portions of our analysis), we use the procedure outlined in Jaeger (1997), which amounts to using the midpoint of the range for each education category below 9th grade. We assign 12th grade completion to individuals who received a traditional high school degree. Because of international differences in secondary school curricula, this may induce some measurement error into the years of schooling measure. Table 1 presents the distribution of high school dropouts, GED recipients, and traditional high school graduates in our data (these categories are defined to be mutually exclusive). Statistics for U.S. native men and women are displayed in the top panel, and for foreign-schooled men and women in the bottom panel. Among both native men and women, Hispanics are more likely than other groups to have dropped out of school prior to receiving a traditional high school diploma. This is even more pronounced for the foreign-schooled, among whom less than 30 percent of Hispanics have a traditional high school diploma. Among natives who drop out, however, whites are the most likely to have received a GED.⁸ The GED accounts for a somewhat larger portion of high school credentials among native Hispanics than among other groups.

GED receipt is much less prevalent among the foreign-schooled than among natives. Overall less than four percent of the foreign-schooled male and female dropouts possess a GED, compared to 26 to 28 percent for natives. There is some variation across race/ethnicity groups, however, with black, non-Hispanic dropouts being most likely to go on to receive a GED.

⁸ The number of Asian native dropouts and GED recipients in our sample (26 men and 33 women) is too small on which to base any reliable conclusions.

Foreign-born Hispanic dropouts are substantially less likely than other race/ethnicity groups to earn a GED.

These differences across race/ethnicity groups in the likelihood of receiving a GED are reflected in the distribution of educational attainment by region of national origin shown in Table 2.⁹ Africans have a higher overall level of educational attainment than other groups, and are more likely to have received a GED. Mexicans have by far the lowest level of education among regional groups, and Mexican dropouts are the least likely to earn a GED in the U.S. Mexicans with a high school credential, however, are as or more likely than most other groups to have earned that credential via the GED. While migrants to the U.S. are more likely to speak English than their non-migrating countryfolk, foreign-born dropouts who come from countries where English is the primary language spoken or where English is one of the official languages are substantially more likely to have received a GED than migrants from other areas.¹⁰ Those born in English-speaking countries are also more likely to have received their high school credential in the form of a GED.¹¹ As shown in Table 3, recent migrants are less likely to possess a traditional high school degree. They are also somewhat less likely to have received a GED. Part of this effect is likely because earlier foreign-born cohorts have had a longer time in the U.S. to earn a GED, although the share of the foreign-born who earned their high school credential via the GED

⁹ Because of the relatively small number of foreign-born GED recipients in our sample, we are not able use a finer level of geographical detail.

¹⁰ Note that unlike the decennial Census, the CPS does not ask respondents about the language spoken in their home. Categories of the CPS country-of-origin variable for which English is the primary or official language are American Samoa, Australia, the Bahamas, Belize, Bermuda, the Caribbean, Dominica, Fiji, Ghana, Great Britain, England, Guyana, India, Ireland/Eire, Jamaica, New Zealand, Nigeria, Northern Ireland, Pakistan, the Philippines, Puerto Rico, Scotland, South Africa, Trinidad and Tobago, and the U.S. Virgin Islands. Individuals born in Canada are excluded from the analysis because Canada also offers the GED.

¹¹ It is possible to take the GED in Spanish or French, although few GED test takers do so. In 1998, only 3.6 percent of GED takers took the Spanish-language edition, and only 0.1 percent took the French-language version. (General Educational Development Testing Service, 1999).

is not monotonically increasing with time in the U.S. Rising skill premiums and returns to educational credentials during the 1980s may have induced the cohort that entered during the 1970s to earn a GED. Unfortunately, the CPS does not include information about when respondents earned their degrees.

While the GED is termed a high school equivalency degree, the amount of formal schooling that GED recipients complete is usually somewhat less than the usual twelve years that it takes to complete a traditional high school degree. In Table 4 we present the distribution of formal educational attainment of GED recipients and dropouts among both natives and the foreign-schooled. The table shows that for all groups, GED recipients complete, on average, about ten years of schooling.¹² Compared to natives, however, the foreign-schooled report much more often having completed 12th grade without earning a diploma and are less likely to report completing 10th or 11th grade. This may be explained, in part, by variation across countries in the number of years to completion of secondary; in some countries secondary school completion takes longer than 12 years. It is also possible that some immigrants who possess a traditional high school degree earned outside of the U.S. acquire the GED and choose to report holding the GED rather than the traditional diploma.

IV. Returns to the GED

We turn now to our estimates of the wage returns to the GED. In Table 5 we present results of regressions of log hourly wages on schooling, estimated separately for natives and for

¹² Years of schooling are imputed from the categorical primary CPS education question using the scheme proposed by Jaeger (1997).

the foreign-schooled.¹³ Because dropping out, receiving a GED, or receiving a traditional high school diploma is very likely to be correlated with a variety of background characteristics that also affect earnings, we include a broad set of control variables in the regressions. For all individuals, we include a quadratic in potential labor market experience (defined as age – imputed years of schooling – 6) and dummy variables for central city residence, 8 geographic regions, each of the months \times years of survey response, black, Hispanic, Asian, and parents' region of origin. Regressions for the foreign-schooled also include dummy variables for U.S. citizenship, having been born in an English-speaking country, world region of birth, entry cohort and a quadratic in years since arrival in the U.S.¹⁴

The top panel presents results of a regression of log wages on a dummy variable indicating GED receipt, a dummy variable representing high school graduation, and the aforementioned covariates. The coefficients therefore represent the conditional mean of log wages of GED and traditional high school relative to high school dropouts. Native men with a GED earn approximately 7.5 percent less than those with a high school diploma, and native women with a GED earn approximately 8.9 percent less than their counterparts with a traditional high school diploma.¹⁵ This difference varies across race groups, and is substantially larger for Hispanics than for either whites or blacks.¹⁶ The conditional mean earnings of blacks with a GED, while smaller, are not statistically significantly different than those with a traditional high school diploma.

¹³ Individuals in the outgoing rotation data can give their earnings or wages in a variety of ways. To calculate hourly wages, we follow the algorithm outlined in Appendix B of Polivka (1997).

¹⁴ For confidentiality reasons, entry cohorts are identified in the CPS with bracketed ranges. We calculate years since arrival in the U.S. are calculated as year of survey – (midpoint of bracket of date of arrival).

¹⁵ Marginal percentage changes are calculated as $\exp(b)-1$, where b is the estimated coefficient.

¹⁶ There are too few native Asians to estimate a separate regression for them. Asians are included in the “all native” columns.

For immigrants, the pattern of relative returns to the GED and a traditional high school diploma is reversed: wages of the foreign-schooled with a GED are statistically significantly larger than those with a traditional high school diploma earned outside of the U.S. Remarkably, the magnitudes of the effects are also essentially reversed as well, i.e. the relative return to the GED for the foreign schooled is roughly the same as for a traditional high school diploma for natives, and vice versa. The relative premium ranges from six percent for women to twelve percent for men, although it is only statistically significantly different from zero for men. This suggests that the U.S. labor market rewards the GED at least as much as a high school diploma earned elsewhere.

As shown in Table 4, there is substantial variation across groups in the amount of formal schooling obtained by dropouts and GED recipients prior to receiving the GED. Because foreign-schooled dropouts have substantially less education than those who receive a GED, part of the difference in conditional mean wages between these groups may simply be due to differences in formal schooling levels.¹⁷ This specification is similar to that of Jaeger and Page (1996), where the coefficients on the indicators for GED receipt and high school diploma receipt can be interpreted as “sheepskin” effects.

For natives, controlling for formal schooling still yields positive and statistically significant effects of receiving both the GED and a traditional high school diploma, although the magnitudes are somewhat smaller than in the top panel. When we pool all race groups, the traditional high school diploma – GED difference falls by more than half, to around three percent, and is not statistically significantly different from zero for women. The difference is

¹⁷ We include dummy variables for all levels in the CPS education question (0, 1–4, 5–8, 9, 10, and 11), but report only the results for grades 9, 10, and 11 in the table. The full results of the estimation are available from the authors

negative for blacks, although not significantly different from zero, while controlling for formal schooling increases the relative return a traditional high school degree for Hispanic women by forty percent (four percentage points). The return to the GED and a traditional high school diploma declines less for the foreign-schooled than for natives when we control for formal schooling. Moreover, the traditional high school degree – GED difference increases by one to two percentage points and remains statistically significantly different from zero for foreign-schooled men.

Taken as a whole, these results suggest that wages of GED recipients are closer to those of traditional high school recipients than to dropouts. They stand in contrast to the findings of Cameron and Heckman (1993) and Cao, Stromsdorfer, and Weeks (1997), who find no statistically significant sheepskin effects of the GED for men or women, respectively. Our results are closer to the findings of Tyler, Murnane, and Willet (2000) and Murnane, Willet, and Tyler (1999), who found positive and significant effects of the GED of roughly the same magnitude in log annual earnings regressions after controlling for ability differences.

While our results, particularly for the foreign-schooled, suggest that earning a GED may be a path towards higher earnings, there are also a variety of reasons to be cautious in our conclusions. As is usually the case with estimating the returns to education via OLS, omitted variables and/or measurement error may lead to bias in our estimates. This may be particularly true for the foreign schooled, where there are a variety of unmeasured characteristics (in particular English language ability) that may be correlated both with earnings and with the

by request. Traditional high school degree recipients are assumed to have 12 years of schooling. The reference category is individuals who reported completing 12 years of schooling without receiving a diploma.

propensity to receive a GED.¹⁸ As noted by Kane and Rouse (1999) and Kane, Rouse, and Staiger (1999), if completed years of schooling are measured with more error than degree completion, OLS estimates of “sheepskin” effects will overstate the true value of degree completion. It is also possible that, given global differences in educational systems, traditional high school completion is measured with more error than GED receipt for the foreign-born, which could induce the “inversion” we observed in the estimated relative returns.

IV. Reconciling Our Findings with Previous OLS Results

Our finding of a positive and significant sheepskin effect of the GED is at odds with other OLS estimates in the literature (e.g. Cameron and Heckman 1993 and Cao, Stromsdorfer and Weeks 1997), and is closer to those of Tyler, Murnane, and Willett’s (2000), who were able to more fully control for unobserved ability. *Ex ante*, we would have expected our results to be closer to Cameron and Heckman and Cao et. al. than to Tyler, Murnane, and Willett.

There are several possible explanations of why our results are so different from those of Cameron and Heckman and Cao et. al. First, our sample consists of individuals aged 25 to 65, while those of the previous studies consisted of individuals under the age of 28. If we think that the effects of the GED might grow in significance over the life cycle, then the returns we estimate, which reflect the average effect of the GED for individuals between the ages of 25 and 64, should exceed the returns to the GED estimated in previous studies. Second, the low returns to the GED observed by Cameron and Heckman and Cao et.al. may have been specific to the cohort that they examined.

¹⁸ Of course, the highest-ability migrants might find it unnecessary to earn a GED or might already possess a traditional high school diploma, which would bias our estimates of the relative return to the GED downward.

To explore these issues, in Table 6 we present estimates from models similar to Cameron and Heckman of the estimated effects of the GED and high school diploma receipt. In the top panel we include dummy variables for race/Hispanic origin and the year in which the survey was fielded; in the bottom panel we add dummy variables for years of education completed. The first two columns present results for men who were twenty-five years old at the time of the survey (1998–2001 for our results in the CPS, and 1982–87 for Cameron and Heckman’s results). The second two columns present results for men who were 28 years old at the time of the survey. While our samples are smaller, the results are similar for both age groups, particular the 28-year-olds. As shown in the top panel, when there are no controls for years of education, both studies find the high school diploma receipt gives a statistically significant return of 12 to 19 percent over dropouts. Both studies find that the GED yields a return that is never statistically significantly different from zero.

The last two columns of Table 6 show estimates of the same model for the birth cohorts that Cameron and Heckman examined, i.e. men who were 25 or 28 years old in 1982–87. For both groups, we find substantially higher returns to the GED and high school diploma receipt than Cameron and Heckman, with the returns to the GED recipients falling more than halfway between those for dropouts and high school graduates. As displayed in the bottom panel, these findings hold as well for the sheepskin effects for both degrees. Taken together, these results suggest that there may be substantial effects of holding a GED that are not manifest early in the life cycle.

Another possible explanation for the differences between our findings and Cameron and Heckman is simply the fact that our data are from a different time period than previous studies. It is well known that the returns to skill, and education in particular, have increased since the

early 1980s. While this trend has apparently slowed somewhat during the 1990s (Murphy and Welch 2001), differences in the returns to skill could partially explain the differences between these studies.

V. Conclusion

We conclude from these results that, for U.S. natives, while the GED may not yield wages that are equivalent to those of traditional high school graduates, GED recipients do appear to earn more than observationally similar dropouts. For individuals who received their formal schooling outside the United States, holding a GED — a recognized U.S. credential — seems to lead to substantially higher wages than even a traditional high school diploma earned outside the U.S. These results are robust to controlling for years of schooling, indicating that a fair portion of the return to the GED and a traditional high school diploma may be due to “sheepskin” effects. While Tyler, Murnane, and Willett (2000), exploiting a natural experiment that allows them to control for unobserved differences between dropouts and GED recipients, present findings that are similar to ours, we are cautious about attaching a purely causal interpretation to our results.

We also find that the returns to the GED appear to increase with age. When examining the same cohorts as Cameron and Heckman (1993) (who found little evidence for significant returns to the GED) 11 to 19 years after the data used in their study, we find large and statistically significant returns to the GED. While GED recipients’ wages are not “equivalent” to traditional high school degree recipients later in life, neither are their wages the same as high school dropouts. We find that this is true even when we control for years of completed schooling.

REFERENCES

- Boesel, David, Nabeel Alsalam, and Thomas M. Smith. 1998. *Educational and Labor Market Performance of GED Recipients*. Washington, DC: National Library of Education, Office of Educational Research and Improvement, U.S. Department of Education.
- Bratsberg, Bernt and James F. Ragan, Jr. 1999. "The Impact of Host-Country Schooling on Earnings—A Study of Male Immigrants in the United States," Kansas State University (July).
- Cameron, Stephen V. and James J. Heckman. 1993. "The Nonequivalence of High School Equivalents," *Journal of Labor Economics*, 11(1): 1–41.
- Cao, Jin, Ernst W. Stromsdorfer, and Gregory Weeks. 1995. "The Human Capital Effect of General Education Development Certificates on Low Income Women," *Journal of Human Resources*, 31(1): 207–228.
- Card, David. 1999. "The Causal Effect of Education on Earnings," in *Handbook of Labor Economics*, Vol. 3, Orley C. Ashenfelter and David Card, eds. Amsterdam: Elsevier: 1801-1863.
- Development Associates. 1994. *National Evaluation of Adult Education Programs, Fourth Report: Learner Outcomes and Program Results*. Arlington, VA: Development Associates.
- Friedberg, Rachel M. 2000. "You Can't Take It with You? Immigrant Assimilation and the Portability of Human Capital," *Journal of Labor Economics*, 18(2): 221–251.
- General Educational Development Testing Service. 1999. *Who Took the GED?: GED 1998 Statistical Report*. American Council on Education.
- Griliches, Zvi. 1977. "Estimating the Returns to Schooling: Some Econometric Problems," *Econometrica*, 45:1–22.
- Jaeger, David A. 1997. "Reconciling the Old and New Census Bureau Education Questions: Recommendations for Researchers," *Journal of Business and Economic Statistics*, 15(3): 300–309.
- Jaeger, David A. and Marianne E. Page. 1996. "Degrees Matter: New Evidence on Sheepskin Effects in the Returns to Education," *Review of Economics and Statistics*, 78(4): 733–740.

- Kane, Thomas J. and Cecilia Elena Rouse. 1999. "The Community College: Educating Students at the Margin between College and Work," *Journal of Economic Perspectives*, 13(1): 63–84.
- Kane, Thomas J., Cecilia Elena Rouse, and Douglas Staiger. 1999. "Estimating Returns to Schooling when Schooling is Misreported," Princeton University, Industrial Relations Section Working Paper # 419, December 1997, revised June.
- Murnane, Richard J., John B. Willett, and John H. Tyler. 1999. "Who Benefits from Obtaining a GED? Evidence from High School and Beyond," NBER Working Paper 7172, June.
- Murphy, Kevin M. and Finis Welch. 2001. "Wage Differentials in the 1990s: Is the Glass Half-Full or Half-Empty?" in *The Causes and Consequences of Increasing Inequality*, Finis Welch, ed. Chicago: University of Chicago Press: 341-364.
- Polivka, Anne E. 1999. "Using Earnings Data from the Current Population Survey after the Redesign," Bureau of Labor Statistics, mimeo.
- Schoeni, Robert F. 1997. "New Evidence on the Economic Progress of Foreign-Born Men in the 1970s and 1980s," *Journal of Human Resources*, 32(4): 683–740.
- Tyler, John H., Richard J. Murnane, and John B. Willett. 2000. "Estimating the Impact of the GED on the Earnings of Young Dropouts Using a Series of Natural Experiments," *Quarterly Journal of Economics*, 115(2): 431–468.
- Willis, Robert J. 1986. "Wage Determinants: A Survey and Reinterpretation of Human Capital Earnings Functions," in *Handbook of Labor Economics*, Vol. 1., Orley C. Ashenfelter and Richard Layard, eds. Amsterdam: North-Holland: 525-602.

Table 1
Educational Attainment of Individuals with High School Diploma or Less

Education Group	Men					Women				
	All	White Non- Hispanic	Black Non- Hispanic	Hispanic	Asian	All	White Non- Hispanic	Black Non- Hispanic	Hispanic	Asian
<i>Natives</i>										
Dropouts	.231	.210	.293	.368	.127	.214	.180	.313	.390	.206
GED recipients	.088	.091	.067	.101	.074	.074	.076	.061	.096	.030
High school graduates	.681	.698	.640	.531	.798	.712	.743	.626	.514	.765
GED Share of Dropouts+GED	.275	.302	.186	.215	.369	.258	.297	.162	.198	.126
GED Share of HS+GED	.114	.115	.095	.160	.085	.095	.093	.088	.157	.037
Share of Natives	.485	.383	.076	.025	.001	.515	.399	.088	.027	.001
<i>Sample size</i>	61,173	50,549	7,857	2,636	131	66,797	53,626	10,026	3,005	140
<i>Foreign-Born, Schooled Outside U.S.</i>										
Dropouts	.567	.310	.388	.715	.381	.556	.301	.378	.724	.423
GED recipients	.020	.028	.050	.015	.014	.019	.025	.048	.012	.022
High school graduates	.413	.662	.563	.270	.606	.425	.673	.573	.264	.556
GED Share of Dropouts+GED	.034	.082	.114	.021	.035	.033	.078	.113	.016	.048
GED Share of HS+GED	.046	.040	.081	.053	.022	.043	.036	.078	.042	.037
Share of Foreign-Born	.465	.071	.040	.274	.080	.535	.086	.045	.279	.125
<i>Sample size</i>	6,176	1,091	530	3,462	1,093	7,373	1,340	643	3,683	1,707

Source: Calculations using weighted CPS Outgoing Rotation Groups from January 1998-May 2001.

Note: Foreign-born exclude those who entered the U.S. before the age of 20.

Table 2
Educational Distribution of Foreign-Schooled with a High School Diploma or Less
by Region of National Origin

Region of national origin	Dropouts	GED recipients	High school graduates	GED share of dropouts + GED	GED share of high school+GED	Region as share of foreign-born HS and under population	Sample size
Africa	.178	.055	.768	.237	.067	.017	224
Europe	.282	.031	.688	.098	.043	.108	1,663
Oceania	.391	.028	.581	.066	.046	.028	394
Central America	.582	.026	.392	.043	.062	.230	3,103
South America	.339	.023	.638	.065	.035	.065	884
Asia	.406	.016	.579	.037	.026	.218	3,024
Mexico	.814	.011	.175	.013	.060	.335	4,257
English-speaking country	.303	.040	.658	.116	.057	.110	1,509
Non-English-speaking country	.593	.017	.390	.028	.042	.890	12,040
<i>Sample size</i>	7,468	268	5,813	7,736	6,081	13,549	13,549

Source: Calculations using weighted CPS Outgoing Rotation Groups from January 1998-May 2001.

Note: Foreign-schooled are foreign-born who entered the U.S. after the age of 20. English-speaking countries include American Samoa, Australia, Bahamas, Belize, Bermuda, Caribbean, Dominica, Fiji, Ghana, Great Britain, England, Guyana, India, Ireland/Eire, Jamaica, New Zealand, Nigeria, Northern Ireland, Pakistan, Philippines, Puerto Rico, Scotland, South Africa, Trinidad & Tobago, and the U.S. Virgin Islands (immigrants from Canada are excluded from this analysis).

Table 3
Educational Distribution of Foreign-Schooled with a High School Diploma or Less
by Cohort of Entry to US

Cohort of entry	Dropouts	GED recipients	High school graduates	GED share of dropouts + GED	GED share of high school+GED	Cohort as share of foreign-born HS and under population	Sample size
pre-1970	.522	.025	.453	.046	.053	.058	806
1970-1979	.607	.029	.365	.046	.074	.148	2041
1980-1989	.579	.018	.403	.030	.043	.363	4852
1990-2001	.536	.017	.448	.030	.036	.431	5850
<i>Sample size</i>	7,468	268	5,813	7,736	6,081	13,549	13,549

Source: Calculations using weighted CPS Outgoing Rotation Groups from January 1998-May 2001.

Note: Foreign-schooled are foreign-born who entered the U.S. after the age of 20.

Table 5
Ordinary Least Squares Regressions for Log-Wages
(Heteroskedasticity-consistent standard errors in parentheses)

	Men					Women				
	Natives				Foreign-born, schooled outside U.S.	Natives				Foreign-born, schooled outside U.S.
	All	White Non-Hispanic	Black Non-Hispanic	Hispanic		All	White Non-Hispanic	Black Non-Hispanic	Hispanic	
<i>Model 1</i> (Reference group is high school dropouts)										
GED	.160 (.010)	.154 (.012)	.208 (.030)	.156 (.037)	.275 (.057)	.163 (.010)	.153 (.012)	.201 (.026)	.197 (.037)	.238 (.056)
High school diploma	.232 (.007)	.227 (.008)	.233 (.017)	.290 (.026)	.160 (.016)	.248 (.007)	.244 (.008)	.239 (.014)	.300 (.024)	.177 (.017)
High school diploma - GED	.072 (.009)	.073 (.010)	.025 (.028)	.134 (.035)	-.115 (.056)	.085 (.009)	.091 (.010)	.038 (.024)	.103 (.035)	-.061 (.056)
R ²	.13	.10	.10	.18	.22	.11	.09	.14	.21	.18
<i>Model 2</i> (Ref. group is high school dropouts who completed 12 years of school)										
9th grade	-.085 (.019)	-.072 (.021)	-.085 (.047)	-.219 (.069)	-.013 (.042)	-.109 (.019)	-.107 (.023)	-.138 (.042)	.011 (.069)	-.027 (.043)
10th grade	-.053 (.016)	-.032 (.019)	-.109 (.039)	-.163 (.060)	-.060 (.046)	-.064 (.017)	-.064 (.021)	-.093 (.037)	.033 (.065)	-.002 (.044)
11th grade	-.025 (.015)	-.003 (.018)	-.057 (.036)	-.161 (.056)	-.007 (.048)	-.043 (.017)	-.042 (.021)	-.073 (.031)	.057 (.066)	.001 (.046)
<i>Marginal effect over no diploma</i>										
GED	.151 (.011)	.144 (.012)	.207 (.030)	.125 (.039)	.257 (.058)	.161 (.010)	.150 (.012)	.202 (.026)	.185 (.036)	.213 (.056)
High school diploma	.183 (.014)	.194 (.017)	.164 (.031)	.122 (.053)	.124 (.037)	.188 (.016)	.183 (.019)	.164 (.030)	.327 (.062)	.142 (.033)
High school diploma - GED	.032 (.015)	.050 (.017)	-.043 (.039)	-.003 (.051)	-.133 (.061)	.027 (.016)	.033 (.020)	-.038 (.035)	.142 (.061)	-.071 (.060)
R ²	.13	.10	.10	.19	.22	.11	.09	.14	.21	.19
<i>Sample size</i>	40,284	33,566	4,749	1,879	4,573	37,931	30,558	5,599	1,691	3,492

Source: Calculations using weighted CPS Outgoing Rotation Groups from January 1998-May 2001.

Notes:

- Both models include separate experience and experience squared terms for each group, as well as dummy variables for MSA/central city status, geographic region, month/year of survey, and parental origin. Regressions for all natives and foreign-schooled include dummies for race, and Hispanic origin. Regressions for foreign-born include dummy variables for entry cohort, region of national origin, U.S. citizenship, origin in English-speaking country, and a quadratic in years in the United States.
- Model 2 includes dummy variables for CPS categories of years of completed education (0, 1-4, 5-8, 9, 10, and 11).
- Foreign-born exclude those who entered the U.S. before the age of 20.

Table 6
Ordinary Least Squares Regressions for Log-Wages:
Comparison of Clark & Jaeger with Cameron & Heckman Estimates
(Heteroskedasticity-consistent standard errors in parentheses)

	25-year-old men		28-year-old men		Clark & Jaeger estimates for Cameron & Heckman cohorts	
	Clark & Jaeger (1998-2001)	Cameron & Heckman (1982-1987)	Clark & Jaeger (1998-2001)	Cameron & Heckman (1982-1987)	Men who were 25 in 1982-1987	Men who were 28 in 1982-1987
<i>Model 1: No control for years of schooling (Reference group is high school dropouts)</i>						
GED	.110 (.070)	.060 (.040)	.035 (.052)	.062 (.062)	.178 (.019)	.220 (.020)
High school diploma	.118 (.043)	.144 (.022)	.161 (.040)	.174 (.037)	.258 (.011)	.285 (.012)
High school diploma - GED	.008 (.060)	.084 (.036)	.126 (.041)	.112 (.054)	.080 (.017)	.065 (.017)
<i>Model 2: Control for years of schooling (Reference group is high school dropouts)</i>						
Years of school	.019 (.023)	.057 (.011)	.015 (.020)	.034 (.014)	.026 (.004)	.025 (.004)
<i>Marginal effect over no diploma</i>						
GED	.115 (.070)	-.016 (.023)	.032 (.053)	.015 (.038)	.163 (.019)	.200 (.020)
High school diploma	.088 (.062)	-.009 (.030)	.136 (.056)	.080 (.057)	.199 (.014)	.225 (.016)
High school diploma - GED	-.027 (.077)	.007 (.011)	.104 (.047)	.065 (.052)	.036 (.018)	.025 (.018)
<i>Sample size</i>	1,012	2,308	1,088	1,016	13,749	13,011

Sources: Clark and Jaeger: Calculations using weighted CPS Outgoing Rotation Groups from January 1998-May 2001.
Cameron and Heckman: Calculations from National Longitudinal Survey of Youth, 1982-87.

Notes:

1. All models include dummy variables for race, Hispanic origin, and year of survey.