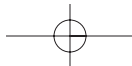
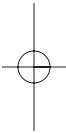
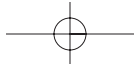




THE PRICE OF INDEPENDENCE





THE PRICE OF INDEPENDENCE

The Economics of Early Adulthood

SHELDON DANZIGER AND
CECILIA ELENA ROUSE
EDITORS

A Volume of the Research Network on Transitions
to Adulthood of The John D. and Catherine T.
MacArthur Foundation

Russell Sage Foundation • New York

The Russell Sage Foundation

The Russell Sage Foundation, one of the oldest of America's general purpose foundations, was established in 1907 by Mrs. Margaret Olivia Sage for "the improvement of social and living conditions in the United States." The Foundation seeks to fulfill this mandate by fostering the development and dissemination of knowledge about the country's political, social, and economic problems. While the Foundation endeavors to assure the accuracy and objectivity of each book it publishes, the conclusions and interpretations in Russell Sage Foundation publications are those of the authors and not of the Foundation, its Trustees, or its staff. Publication by Russell Sage, therefore, does not imply Foundation endorsement.

BOARD OF TRUSTEES

Kenneth D. Brody	Thomas D. Cook, Chair	Cora B. Marrett
Robert E. Denham	Jennifer L. Hochschild	Richard H. Thaler
Christopher Edley Jr.	Kathleen Hall Jamieson	Eric Wanner
John A. Ferejohn	Melvin J. Konner	Mary C. Waters
Larry V. Hedges	Alan B. Krueger	

Library of Congress Cataloging-in-Publication Data

The price of independence : the economics of early adulthood / Sheldon Danziger and Cecilia E. Rouse, editors.

p. cm.

ISBN 978-0-87154-316-5

1. Adulthood—Economic aspects—United States. 2. Young adults—United States—Economic conditions. 3. Labor market—United States. 4. Cost and standard of living—United States. 5. Family—Economic aspects—United States. I. Danziger, Sheldon. II. Rouse, Cecilia Elena. III. Title: Economics of early adulthood.

HQ799.97.U5P75 2007

305.2420973—dc22 2007018408

Copyright © 2007 by Russell Sage Foundation. All rights reserved. Printed in the United States of America. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

Reproduction by the United States Government in whole or in part is permitted for any purpose.

The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials. ANSI Z39.48-1992.

Text design by Suzanne Nichols.

RUSSELL SAGE FOUNDATION
112 East 64th Street, New York, New York 10021
10 9 8 7 6 5 4 3 2 1

Contents

	About the Authors	vii
Chapter 1	Introduction: The Price of Independence: The Economics of Early Adulthood <i>Sheldon Danziger and Cecilia Elena Rouse</i>	1
PART I	SECURING EMPLOYMENT AND COMPLETING SCHOOLING	25
Chapter 2	Failure to Launch: Cross-National Trends in the Transition to Economic Independence <i>Lisa Bell, Gary Burtless, Janet Gornick, and Timothy M. Smeeding</i>	27
Chapter 3	Is the Company Man an Anachronism? Trends in Long-Term Employment in the United States, 1973 to 2006 <i>Henry S. Farber</i>	56
Chapter 4	Health Insurance and the Transition to Adulthood <i>Helen Levy</i>	84
Chapter 5	Blurring the Boundary: Changes in Collegiate Participation and the Transition to Adulthood <i>Maria D. Fitzpatrick and Sarah E. Turner</i>	107
PART II	LIVING WITH PARENTS LONGER AND STARTING FAMILIES LATER	139
Chapter 6	Labor Market Experiences and Transitions to Adulthood <i>Carolyn J. Hill and Harry Holzer</i>	141

vi	Contents	
Chapter 7	Young Adults Leaving the Nest: The Role of the Cost of Living <i>Aaron S. Yelowitz</i>	170
Chapter 8	Sticking Around: Delayed Departure from the Parental Nest in Western Europe <i>Katherine Newman and Sofya Aptekar</i>	207
Chapter 9	To Have and to Hold: An Analysis of Young Adult Debt <i>Ngina S. Chiteji</i>	231
PART III	FAMILY BACKGROUND, INCARCERATION, AND THE TRANSITION TO ADULTHOOD	259
Chapter 10	Family Background and Children's Transitions to Adulthood over Time <i>Melanie Guldi, Marianne E. Page, and Ann Huff Stevens</i>	261
Chapter 11	Early Incarceration Spells and the Transition to Adulthood <i>Steven Raphael</i>	278
	Index	307

About the Authors

Sheldon Danziger is Henry J. Meyer Distinguished University Professor of Public Policy and codirector of the National Poverty Center at the Gerald R. Ford School of Public Policy at the University of Michigan, and a member of the MacArthur Foundation Research Network on Transitions to Adulthood.

Cecilia Elena Rouse is Theodore A. Wells '29 Professor of Economics and Public Affairs at Princeton University, Director of the Princeton Education Research Section and a member of the MacArthur Foundation Research Network on Transitions to Adulthood.

Sofya Aptekar is a graduate student in the department of sociology and Office of Population Research at Princeton University.

Lisa Bell is a graduate student in the public policy department at the Goldman School of Public Policy, University of California, Berkeley.

Gary Burtless holds the John C. and Nancy D. Whitehead Chair in Economic Studies at the Brookings Institution.

Ngina S. Chiteji is an associate professor in the department of economics at Skidmore College.

Henry S. Farber is the Hughes-Rogers Professor of Economics at Princeton University.

Maria D. Fitzpatrick is a Spencer Foundation Dissertation Fellow and an Institute for Education Sciences Pre-Doctoral Fellow in the economics department at the University of Virginia.

Janet Gornick is professor of political science and sociology at The Graduate Center, City University of New York (CUNY), professor of political science at Baruch College, CUNY, and director of the Luxembourg Income Study.

viii About the Authors

Melanie Guldi is an assistant professor at Mount Holyoke College.

Carolyn J. Hill is an assistant professor in the Georgetown Public Policy Institute at Georgetown University.

Harry Holzer is professor of public policy at Georgetown University, visiting fellow at the Urban Institute, and a former chief economist at the U. S. Department of Labor.

Helen Levy is a Research Assistant Professor at the Institute for Social Research at the University of Michigan.

Katherine Newman is the Forbes Class of 1941 Professor of Sociology and Public Affairs at Princeton University and director of the Princeton Institute for International and Regional Studies.

Marianne E. Page is an associate professor of economics at the University of California, Davis, and a member of the National Bureau of Economic Research.

Steven Raphael is professor of public policy at the University of California, Berkeley, and a Research Affiliate of the National Poverty Center.

Timothy M. Smeeding is Distinguished Professor of Economics and Public Administration at the Maxwell School of Syracuse University, and will be a visiting scholar at the Russell Sage Foundation in 2007–2008.

Ann Huff Stevens is an associate professor of economics at the University of California, Davis, and a member of the National Bureau of Economic Research.

Sarah E. Turner is associate professor of education and economics at the University of Virginia, and a member of the National Bureau of Economic Research.

Aaron S. Yelowitz is an associate professor in the department of economics at University of Kentucky.

Chapter 7

Young Adults Leaving the Nest: The Role of the Cost of Living

AARON S. YELOWITZ

A *Time* magazine article published January 24, 2005, and entitled “They Just Won’t Grow Up” discusses the widely held perception that the transition to adulthood has become longer. The article describes the emergence of “twixters,” young adults in their twenties who refuse to settle down. In response to the question “What makes you an adult?” people age eighteen to twenty-nine answered: having a first child (22 percent), moving out of the parents’ home (22 percent), getting a good job with benefits (19 percent), getting married (14 percent), and finishing school (10 percent). Despite the fact that such perceptions about adulthood are quite standard, only 61 percent of survey respondents viewed themselves as adults. Thirty-five percent of respondents who did not consider themselves adults claimed that they were “just enjoying life the way it is,” and one-third stated that they were “not financially independent enough” to be an adult.¹

These responses motivated this study of trends in living arrangements and the role of the cost of living in the transition to adulthood. Many twixters who were “enjoying life” were living with their parents, and those who said they were not financially independent highlighted the importance of housing costs, transportation costs, and child care costs. This chapter describes the living arrangements of young adults age eighteen to thirty-four from 1970 to 2000 and explores the role of the cost of living, particularly housing and rental costs, in explaining these trends between 1980 and 2000.² The analysis sheds light on the broader implications of the housing boom and slowdown that many local markets have experienced in recent years.³ Dramatic changes in housing

costs might disproportionately affect young adults, who are more mobile and usually entering the housing market for the first time.

After a brief review of previous work that examines young adults leaving the nest, I describe the census data and a framework for examining living arrangements. This is followed by descriptions of the cost-of-living variables used, an overview of trends from 1970 to 2000, and the results from the empirical analysis. I conclude with a discussion of some possible implications of these findings on the transition to adulthood.

Previous Research

Many existing studies of the living arrangements of youth focus on those personal and family characteristics that influence determinants of living arrangements.⁴ Testing for the effects of economic variables has been quite limited (Haurin, Hendershott, and Kim 1993). The studies that do examine economic variables—such as housing costs—offer mixed evidence on the effects on living arrangements; they also suffer serious difficulties in isolating the effect of housing costs. This section highlights some of the findings from several key publications.

Donald Haurin, Patric Hendershott, and Dongwook Kim (1993, 1994) use a cross-sectional dataset of young adults in 1987 to examine the effect of housing costs and economic factors on living arrangements. In one study, the authors find that higher rents cause fewer young adults to live outside of the parental home and more young adults to live in groups. In the other, they find that the relative cost of homeownership is important to a young adult's own-versus-rent decision.⁵ Both studies rely on a single dataset that has small sample sizes. More importantly, by relying on a single cross-section, the authors are unable to account for other factors that vary across localities and could be correlated with both housing costs and living arrangements.

In contrast to those studies, a more recent study by Steven Garasky, Jean Haurin, and Donald Haurin (2001) finds that economic variables have little impact on the decision to leave a living arrangement or not, whether a large arrangement (more than one other nonspouse or nonpartner adult) or a small one (one nonspouse or nonpartner adult), while sociodemographic variables do matter.

This study offers a number of innovations relative to previous work. First, the previous studies were based on relatively small samples. This analysis uses census data from 1970 to 2000 with millions of observations. This study also examines changes in market conditions over long periods, whereas earlier studies examined shorter time periods (often a single point in time). Finally, this study emphasizes metropolitan-level variables (such as economic conditions) rather than focusing only on individual or family variables.

Study Sample and Methodology

Living Arrangements and Sample

The sample for this analysis was drawn from the census public use data from 1970, 1980, 1990, and 2000 (U.S. Department of Commerce 1971, 1985, 1995, 2003; for more detail on the data and sample, see appendix A). The young adults in the sample are age eighteen to thirty-four. I created four mutually exclusive living arrangements that are comparable across the 1970 to 2000 censuses.⁶ Each young adult is assigned to one of these categories:⁷

Independent. The young adult is either the head or the spouse, and the only members of the household are the head, the spouse, and natural, adopted, or stepchildren under the age of eighteen. For example, a married couple with young children would be included in this category, as would a young adult living by herself or himself. A single mother would also fit into this category, but a cohabitating couple would not.

Economic arrangement. The young adult resides only with same-generation family members (siblings, cousins, and so forth) or same-generation others who are not family members (or both). Households with children under age eighteen or members of an older generation (parents, grandparents, uncles, aunts, and so forth) are excluded. For example, two adult siblings sharing an apartment together would fall into this arrangement, as would two unrelated college students living in an apartment.⁸

Not independent (parental arrangement). The young adult lives in a household with only family members, and at least one of those family members is of an older generation (such as parents, grandparents, uncles, and aunts). For example, a young man living with his parents or his grandparents would fall into this category.

Other. Some household arrangements are a hybrid of these three types of arrangements and are difficult to characterize in terms of the transition to adulthood. These fall under the "other" category and are excluded from the analysis. For example, a married couple with children who rent out a room to an unrelated individual are in a living arrangement that might be considered either independent or economic. The same would be true of a single mother with a roommate. Living arrangements for a young adult male who lives with his parents and has an unmarried female partner are likewise difficult to classify. Would the unmarried female partner be classified as living in an economic arrangement, an independent arrangement, or a non-independ-

ent arrangement? Across the four census decades, approximately 10 percent of young adults fall into this category, and there is very little variation by age.⁹

Although this study treats independent living arrangements, economic living arrangements, and parental living arrangements as different degrees of moving into adulthood, richer microdata, if available, could be more informative. For example, a young man with wealthy parents might receive a large subsidy to live in his own apartment, yet such a subsidy suggests that he is not independent of his parents. Unfortunately, the census provides no information on intrafamily transfers for individuals living in separate households, so there is no way to detect such arrangements.

In addition to restricting the sample to individuals age eighteen to thirty-four, I excluded those living in group quarters. Because the cost-of-living variables vary at the metropolitan statistical area (MSA) level, I also required that the individual live in a uniquely identified MSA for the 1980 to 2000 census years (for more detail on the MSA restrictions, see appendix A). Overall, 57 MSAs had complete information on house price indices, fair market rents, and median house prices, yielding a final sample size of 3,636,296, with around 1.3 million observations on young adults in each census year.

I was unable to create categories of living arrangements that combined housing tenure (owning or renting) with household composition—that is, the simultaneous decision of housing tenure and household composition (see appendix A for details). The motivation for combining the two is to gain a more detailed characterization of the transition to adulthood. For example, most people would agree that a homeowner living independently represents a greater transition to adulthood than a renter living independently.

Analysis

A key contribution of this study is to carefully incorporate local cost-of-living variables that vary over time and across metropolitan areas, providing a more compelling empirical framework for estimating these costs than previous studies. Given the recent real estate boom, particular attention is given to modeling the impact of housing costs. Housing prices, rental costs, transportation expenses, child care costs, and labor market conditions can all affect whether young adults can afford to live independently, and understanding those factors can help us sort out the question of whether economic conditions or other factors, such as individual preferences, are associated with their decisions to remain living with their parents or in other dependent situations.

174 The Price of Independence

For housing prices, I use the house price index (HPI), a broad measure of the movement of single-family house prices, available from the Office of Federal Housing Enterprise Oversight (OFHEO) on a quarterly basis (for more on this index, see appendix A). The index is based on single-family, detached properties using data on conventional conforming mortgages obtained from the Freddie Mac and Fannie Mae. The HPI gives only relative changes, not absolute changes, in values for housing prices. To obtain price levels, I use median home prices from the National Association of Realtors (NAR) quarterly report on metropolitan-area existing-home prices.¹⁰ This report reflects sales prices of existing single-family homes by MSA. I account for the quality of the stock of homes over time (see appendix A for details) and also calculate the tax deductions for mortgage interest and the changing mortgage interest rates and “points” paid on a mortgage. Interest rates and points (combined) varied between 7.25 percent and 17.21 percent during the period under study.

In addition to housing prices, I also estimate the effects of rent, as measured by the fair market rent series of the U.S. Department of Housing and Urban Development (HUD). I also estimate the separate impact of transportation costs. Although transportation costs are often thought of in terms of expenditures on vehicles, insurance, maintenance, and fuel, longer commuting times are likely to be positively correlated with more intensive vehicle use. Moreover, the opportunity cost of an individual’s time is itself a cost of commuting. Because it is difficult to obtain direct expenditure measures on transportation that vary across locality and over time, I use commuting time to proxy for these expenditures. Likewise, I include child care costs, controlling for fixed differences across MSAs and over time (see appendix A for details on these calculations).

The motivation for including housing costs, rents, transportation costs, and child care costs separately is that they may act differently on the transition to adulthood. For example, we might expect higher child care costs to affect a woman’s transition differently than a man’s, while there is little reason to believe that higher rents would have a different impact on women’s and men’s transitions. In addition, cost-of-living measures are likely to be positively correlated with each other. Localities with high housing costs tend to have longer commuting times and higher child care costs. If transportation costs or child care costs were excluded, the empirical framework would incorrectly attribute their effects on living arrangements to housing costs.

Another important factor to consider is labor market conditions. It is possible that we could find that higher housing costs or rents lead to greater independence of young adults, but that correlation could reflect the fact that healthy labor markets tend to have greater housing demand,

higher incomes, and more independence. Thus, I include the statewide unemployment rate for each MSA in each census year. I use the statewide rather than the MSA-wide unemployment rate because the latter was not easily obtainable prior to 1990 (for more detail on each of these variables and their measurement, see appendix A).

To estimate the effect of each of these cost measures on a young adult's choice of living arrangement (living independently, economic arrangement, or non-independent living), I created a model that accounts for either the monthly house payment or the median house price, the fair market rent, commuting times in minutes, average estimated child care costs, and the statewide unemployment rate. I also include covariates that are believed to affect living arrangements, including controls for age (dummy variables for single years of age), sex, race-ethnicity, educational attainment, current school enrollment, U.S. citizenship, current marital status, whether the individual lived in the same state five years prior to the census, and the prior year's earnings. Finally, I include dummy variables for MSA (fifty-seven separate localities, as shown in table 7A.1) and year (1980, 1990, and 2000; for more detail on the model, see appendix B).

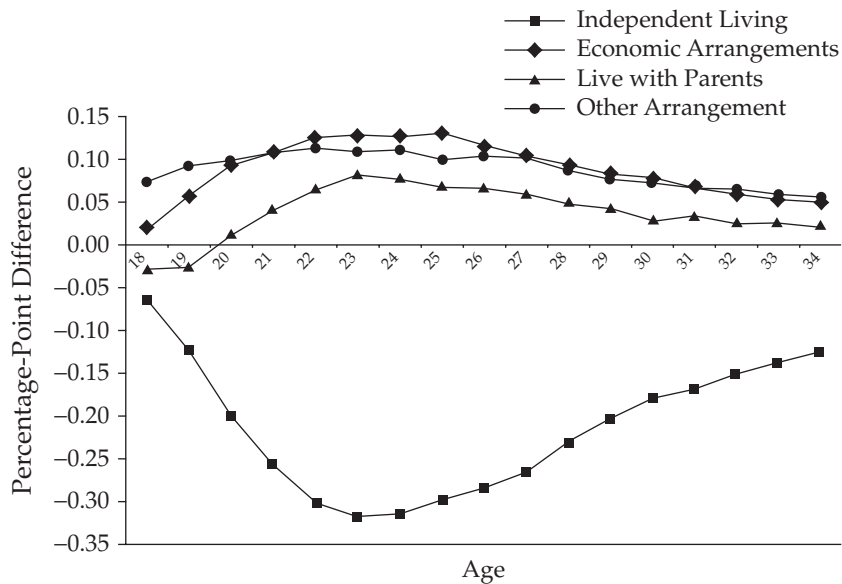
Trends in Living Arrangements by Age from 1970 to 2000

Figure 7.1 examines how each of the four living arrangements described here evolved between 1970 and 2000, by age of the young adult.

Figure 7.1 shows that the percentage of young adults who live independently has declined dramatically during the last thirty years. Further tabulations (not shown) reveal that independent living also declined from one decade to the next, and for all ages. Most notable is the decline in independent living among those in their mid-twenties. Among twenty-four-year-olds, for example, the percentage living independently fell by more than thirty percentage points. In contrast, there has been a much less dramatic change for young adults at either end of the age spectrum. One hypothesis that could explain this age pattern and time pattern is that a greater percentage of those in their early twenties are going to college and staying in school longer.

This schooling hypothesis is also consistent with the percentage of young adults living in an "economic arrangement." The fraction living with either unrelated individuals or family members of the same generation peaks in the early twenties and then declines. Over the decades (not shown), these patterns became more dramatic. For example, the percentage of twenty-one-year-olds living in an economic arrangement doubled in the last thirty years, from 10 to 21 percent.

Figure 7.1 also seems to support one of the key points of the *Time*

Figure 7.1 Changes from 1970 to 2000 in Living Arrangement, by Age

Source: Author's calculations.

magazine article—that more adult children (especially those in their mid-twenties) live with their parents than in earlier generations. However, this trend appears to have started earlier than *Time's* “twixters” article would suggest. Most of the living-with-parents increase was among twenty-three- to twenty-seven-year-olds between 1980 and 1990 (figure 7.1 shows only the 1970 to 2000 change), when the percentage living with their parents increased from 18 to 25 percent. Apparently today’s twixters are not much different from other cohorts of young adults since 1990.

Finally, figure 7.1 shows a steady rise over time in “other living arrangements.” Between 1970 and 2000, the percentage living in this arrangement roughly doubled, from 7 to 15 percent. Yet the fraction of young adults living in this arrangement remained fairly low, even in 2000, and there is no obvious trend by age.

Results from Empirical Model from 1980 to 2000

Summary Statistics

Table 7.1 presents summary statistics for the full sample of 3.6 million young adults and also breaks out the sample by census year and whether

the individual is over or under age twenty-five. On average, 55 percent of young adults lived in “independent” arrangements, but there was a ten-percentage-point drop between 1980 and 2000, with roughly equal percentage-point rises in economic living arrangements and non-independent arrangements. Age plays a critical factor: those age twenty-five to thirty-four are nearly fifty percentage points more likely to be living independently than those age eighteen to twenty-four (72 and 25 percent, respectively). More than half of the sample is female, and nearly 70 percent are white. A number of characteristics changed over the twenty-year horizon. For example, the percentage of individuals of Hispanic ethnicity doubled from 8 to 17 percent. The number of dropouts remained fairly constant at about 17 percent, but there was a decrease in individuals with a high school diploma, from 32 to 24 percent, and an increase in individuals with at least some college, from 51 to 59 percent. By 2000 nearly one-quarter of young adults were still enrolled in school. Therefore, a shift from high school to college educational attainment between 1980 and 2000 is evident both in terms of years of schooling and school enrollment.

Individual annual earnings (which includes nonworkers) rose in real terms, from \$18,000 to \$22,000, between 1980 and 2000, and the unemployment rate fell from 7.2 to 4.1 percent. The percentage who were U.S. citizens declined from 94 percent to 87 percent, and the percentage who were married fell from 48 percent to 41 percent. Mobility increased dramatically over this period. The fraction who had lived in the same state five years earlier fell from one-half to one-third.

Over the entire period, the median house price was \$157,320. It rose in real terms between 1980 and 1990 and then declined.¹¹ The monthly housing payment—which accounts for credit market conditions and tax deductibility and also keeps housing quality constant—fell dramatically, from \$1,476 to \$1,092, a 26 percent drop.¹² In contrast, monthly rental payments rose slightly during this period, from \$726 to \$741. Commuting time increased from twenty-three to twenty-seven minutes, but there was no clear trend in child care costs.

Main Results

Table 7.2 summarizes the results from the model estimating the effect of housing and other costs on the probability of living independently (see table 7A.2 for full results). The first three columns examine housing values, which are measured in \$10,000 increments. As the first cell shows, there is a statistically significant, negative relationship between house values and independent living arrangements. For every \$10,000 increase in house value, there is a 0.61-percentage-point decline in independent living. In contrast, as housing costs rise, so does the number of youth living in an economic arrangement or living non-independently.

178 The Price of Independence

Table 7.1 Summary Statistics for Young Adult Sample Used in Regression Analysis

	1980	1990	2000	Age Less than Twenty-five	Age Twenty-five or Older
Independent	0.60	0.53	0.50	0.25	0.72
Economic	0.12	0.15	0.17	0.17	0.13
Not independent	0.29	0.33	0.32	0.58	0.15
Age	25.9 (4.8)	26.6 (4.8)	26.5 (4.9)	21.1 (2.0)	29.5 (2.8)
Male	0.49	0.49	0.49	0.49	0.49
White	0.75	0.71	0.60	0.66	0.70
African American or black	0.14	0.13	0.14	0.15	0.13
Hispanic	0.08	0.12	0.17	0.13	0.11
Other nonwhite	0.03	0.05	0.09	0.05	0.05
High school dropout	0.17	0.16	0.17	0.23	0.12
High school graduate	0.32	0.27	0.24	0.31	0.26
Some college	0.51	0.57	0.59	0.46	0.61
Enrolled in school	0.19	0.23	0.24	0.38	0.12
U.S. citizen	0.94	0.92	0.87	0.92	0.91
Currently married	0.48	0.44	0.41	0.21	0.60
Lived in same state five years ago	0.50	0.35	0.33	0.46	0.36
Individual earnings in prior year, including nonworkers	17,985 (18,395)	20,843 (22,736)	22,266 (28,099)	10,954 (12,638)	25,850 (26,151)
Year is 1980	1.00	0.00	0.00	0.41	0.35
Year is 1990	0.00	1.00	0.00	0.30	0.34
Median house price	141,387 (42,548)	169,370 (83,809)	163,984 (65,809)	155,994 (65,149)	158,125 (67,174)
Monthly house payment based on market conditions	1,476 (444)	1,399 (692)	1,092 (438)	1,337 (553)	1,330 (563)
Monthly fair market rent	726 (113)	734 (156)	741 (162)	731 (141)	734 (145)
Average travel time in MSA in minutes	22.9 (2.6)	24.0 (2.5)	26.9 (3.0)	24.4 (3.1)	24.6 (3.2)

Higher rents seem to have no impact on living independently; perhaps surprisingly, higher rent levels lead to fewer young adults living with parents and more young adults living in economic arrangements. Higher commuting costs slow the transition to adulthood: the likelihood of living with parents goes up one percentage point for every two additional commuting minutes.¹³

The results for child care costs are not intuitive: higher child care costs

Young Adults Leaving the Nest 179

Table 7.1 (Continued)

	1980	1990	2000	Age Less than Twenty-five	Age Twenty-five or Older
Average hourly wage of child care workers in MSA	8.81 (1.06)	8.04 (1.26)	9.15 (0.85)	8.68 (1.15)	8.66 (1.17)
Statewide unemployment rate	7.2 (1.5)	5.6 (0.8)	4.1 (0.7)	5.8 (1.7)	5.7 (1.7)
Median house price at age twenty-five		149,900 (61,859)	155,038 (62,392)		152,396 (62,172)
Monthly house payment at age twenty-five		1,444 (557)	1,049 (434)		1,252 (539)
Monthly fair market rent at age twenty-five		731 (130)	743 (165)		737 (148)
Sample size: all ages	1,350,065	1,164,891	1,121,340	1,374,110	2,262,186
Sample size: age twenty-five or older		758,512	716,400		1,474,912

Source: Author's calculations.

Note: Standard deviations in parentheses. "Independent" is defined as a living arrangement in which the young adult is living either alone or with a spouse and/or natural, adopted, or stepchildren under eighteen only. "Economic" is defined as a living arrangement in which the young adult is living with unrelated individuals and/or same-generation family members (for example, a spouse, siblings, or cousins), but no members of older generations (for example, parents, grandparents, or uncles/aunts); in addition, no children under eighteen are present. "Dependent" is defined as a living arrangement in which the young adult is living in a household with only family members and at least one of those family members is a member of an older generation (for example, parents, grandparents or uncles/aunts). If a young adult did not fit into one of these three categories (for example, a single mother with roommates), he or she was excluded from the regression analysis. All dollar amounts (individual earnings, median house price, monthly house payment, monthly fair market rent, average wage of child care workers, and their equivalents at age twenty-five) are expressed in constant 2000 dollars. The MSA-level measures of housing market conditions at age twenty-five are calculated only in the 1990 and 2000 census years. The sample includes MSAs that meet the following criteria: (1) the MSA was defined in the 1980, 1990, and 2000 census PUMS; (2) median house price data were available from recent National Association of Realtors publications (see www.realtor.org); (3) house price index data were available from 1980 onward from the Office of Federal Housing and Enterprise Oversight (www.ofheo.gov); (4) fair market rent data were available from the U.S. Department of Housing and Urban Development (www.huduser.org); and (5) the MSA had more than 20,000 individual observations on young adults from the 1980 to 2000 period.

lead to more independent living. This may suggest that the measure being used—child care wages—is reflecting characteristics besides the child care market. For example, markets with higher child care wages may also have higher wage levels in general. If this is the case, those higher wage levels may foster independence.¹⁴

Table 7.2 Summary of Results from "Differences-in-Differences" Specification

	(1) Independent	(2) Economic	(3) Not Independent	(4) Independent	(5) Economic	(6) Not Independent
Median house price (\$10,000 change)	-0.0061*	0.0011*	0.0021*	—	—	—
Monthly house payment (\$1,000 change)	—	—	—	-0.0584*	0.0221*	0.0041
Monthly fair market rent (\$1,000 change)	0.0072	0.0453*	-0.0824*	-0.0457	0.0362*	-0.0371
Average travel time (one-minute change)	-0.0050*	-0.0026	0.0048*	-0.0065*	-0.0023*	0.0052*
Average wage of child care workers (\$1 hourly increments)	0.0058*	0.0015	-0.0070*	0.0057*	0.0007	-0.0059*
Statewide unemployment rate (one percentage point)	-0.0091*	-0.0029*	0.0098*	-0.0101*	-0.0018*	0.0090*

Source: Author's calculations.

Notes: See appendix B for full results. Asterisk indicates variable is statistically significant at a 95 percent level of confidence.

Finally, adverse labor market conditions delay the transition to adulthood. A one-percentage-point increase in the unemployment rate lowers the probability of living independently by 0.9 percentage points.

The individual characteristics (presented in table 7A.2) show that males, Hispanics (relative to whites), other nonwhites (relative to whites), students, and individuals who lived in the same state five years prior are all significantly less likely to be in an independent living arrangement.¹⁵ In contrast, African Americans, the currently married, the college-educated, U.S. citizens, and high earners are all significantly more likely to be living independently.

Using housing payments rather than housing values (columns 4, 5, and 6) finds a similar story. Every \$100 increase in the monthly housing payment leads to a 0.58-percentage-point decline in living independently. In contrast to housing values, monthly housing payments seem to have no effect on living with parents, but they increase the likelihood of living in an economic arrangement. Higher rents significantly increase the likelihood of living in an economic arrangement but have insignificant effects on other living arrangements. Other than those differences, the results are similar to the calculations with housing values.

A number of variables in the previous specification could be criticized on the grounds that they are determined at the same time as living arrangements, meaning they are endogenous to the empirical model. One could argue that location is endogenous; that is, when an individual wants to “settle down” and live independently, he or she moves to a more affordable MSA.¹⁶ Some of the individual characteristics could also be viewed as problematic, especially school enrollment, marital status, and earnings. The role of earnings has been addressed in previous studies. Garasky, Haurin and Haurin (2001, 332) argue that “participation in the paid labor force is a decision that occurs jointly with the decision on household formation. For example, a youth may not work because he or she is subsidized in the parental household.” As a result, they use a predicted wage. I reestimated the models excluding individual earnings. The results on the cost-of-living variables are similar to the main specification. For example, a \$10,000 increase in house prices leads to a statistically significant 0.49-percentage-point drop in independent living rather than the 0.61-percentage-point drop in table 7.2.¹⁷ The statistical significance disappears for non-independent living arrangements, but all of the directions are similar to the full specification.

An important question about the main results is whether the impact of the cost-of-living variables is economically meaningful in addition to being statistically significant. To figure this out, table 7.3 shows the results of two exercises. The first exercise is moving each economic variable from the twenty-fifth percentile to the seventy-fifth. Such a movement spans a realistic range of cost-of-living values that an individual

Table 7.3 Evaluating the Effects Using the Main Specification

	Are the Coefficients Meaningful?					
	Move from 25th to 75th Percentile for Each Independent Variable					
	Independent	Economic	Not Independent	Independent	Economic	Not Independent
Median house price	-0.051	0.009	0.018	—	—	—
Monthly house payment	—	—	—	-0.044	0.017	0.003
Monthly fair market rent	0.001	0.007	-0.013	-0.007	0.006	-0.006
Average travel time in minutes	-0.025	-0.013	0.024	-0.033	-0.012	0.026
Average wage of child care workers	0.009	0.002	-0.011	0.009	0.001	-0.009
Statewide unemployment rate	-0.022	-0.007	0.023	-0.024	-0.004	0.021
Mean of dependent variable	0.545	0.143	0.312	0.545	0.143	0.312
Can the Cost of Living Explain the Time-Series Trends?						
Change 1980 Values to 2000 Values						
Median house price	-0.014	0.002	0.005	—	—	—
Monthly house payment	—	—	—	0.022	-0.008	-0.002
Monthly fair market rent	0.000	0.001	-0.001	-0.001	0.001	-0.001
Average travel time in minutes	-0.020	-0.010	0.019	-0.026	-0.009	0.021
Average wage of child care workers	0.002	0.000	-0.002	0.002	0.000	-0.002
Statewide unemployment rate	0.028	0.009	-0.031	0.032	0.006	-0.028
Dependent variable, 1980	0.597	0.116	0.287	0.597	0.116	0.287
Dependent variable, 2000	0.504	0.173	0.324	0.504	0.173	0.324
Change over time	-0.093	0.057	0.037	-0.093	0.057	0.037

Source: Author's calculations.

might face. The second is examining the actual change in each economic variable between 1980 and 2000.

The first exercise shows that housing prices or monthly housing payments may affect living arrangements. If an individual faced housing costs in the seventy-fifth percentile rather than the twenty-fifth percentile (equivalent to facing Washington, D.C., housing costs rather than Houston housing costs), independent living falls by five percentage points, from a baseline of 55 percent. Although housing costs matter, they explain only a small part of the 9.3-percentage-point decline in independent living between 1980 and 2000. Increasing housing costs from the 1980 to the 2000 value leads to a 1.4-percentage-point drop in independent living. Housing costs are therefore a small factor in the drop in independent living.

The other two noteworthy economic variables are transportation costs and labor market conditions. Moving from the first to the third quartile in travel time leads to a 2.5-percentage-point decline in independent living; a similar movement in the unemployment rate leads to a 2.2-percentage-point decline. However, labor market conditions do a poor job of explaining the time trends, because the labor market improved between 1980 and 2000 at the same time that independent living decreased. On the other hand, increased travel times can explain two percentage points of the 9.3-percentage-point decline in independent living—a larger share than housing costs.

I also estimated the model by gender, by age, and by race (results available on request). Changes in credit markets, for example, may have increased the opportunities to enter the housing market for minority youth relatively more than for whites, and these changes may also have interacted with the included cost-of-living variables. Specifically, the greater reliance by lenders on credit scoring—where race and ethnicity are not factors—would lead to relatively greater changes in opportunities for minorities to live independently and a greater responsiveness to changing market conditions.¹⁸ Nonwhites are considerably more responsive to changing market conditions than whites. A \$10,000 increase in the price of housing leads to a 0.9-percentage-point drop in independent living for nonwhites, an effect that is more than double that for whites. In addition, the effects of housing costs on living with parents (non-independent living) show up significantly for nonwhites but not for whites.

I found virtually identical marginal effects for males and females. The results by age show more responsiveness for those older than twenty-five than for younger adults, which should be expected since older adults are more likely to have completed their schooling. Nonetheless, the difference is relatively modest. A \$10,000 increase in house price leads to a 4.3-percentage-point decline in independent living for older individuals, and a 3.6-percentage-point decline for younger ones.

184 The Price of Independence

Finally, we need to recognize that marriage, fertility, and living arrangements may be jointly determined. Living independently could facilitate marriage or children, and marriage or children could press a young adult to move out of the parents' home. In defining independent, non-independent, other, and economic living arrangements, a household with children could only fall into the first three categories.

I reran the basic specifications, attempting to control for marriage and childbearing more carefully. In particular, I reestimated the models including the number of children as an additional control, and I also estimated models separately for young adults with any children or no children. The first exercise—including number of children as an additional control—had no effect. Perhaps more interesting, the response to housing prices was virtually identical for young adults with or without children. Among those without children, the probability of independent living fell by 0.58 percentage points for every \$10,000 increase in house value. For those with children, it fell by 0.62 percentage points. If anything, we would expect young adults without children to be more responsive to changes in housing prices, since they are less constrained by issues like overcrowding, schools, and neighborhood quality. The fact that the responses are the same suggests that family structure does not interact with housing prices in an important way to bias the results.

Table 7.4 summarizes results for the thirteen MSAs that experienced significant volatility in housing prices (increases in real housing costs of 30 percent in a three-year period) (full results are presented in table 7A.3). Here again, housing costs are rather limited in explaining the time-series trends. The results suggest that the impact of a \$10,000 change in housing prices is about one-tenth that found in the main specification.

Before dismissing the idea that housing costs matter based on these thirteen MSAs, we should consider the possibility that many individuals did not live in the same MSA during the census year (when living arrangements were recorded) as they did at age twenty-five (when the market conditions were measured). Two-thirds of all young adults in the 2000 census lived in a different state in 1995 (the same was true for young adults in the 1990 census). By measuring the individual's locality at age twenty-five with error, the effect of housing costs is too small. Also, the sample examines MSAs with rapid rises in housing appreciation. It is possible that individuals based their decision to live independently on both current housing costs and their expectation of future housing costs. When housing prices rise rapidly in a short time period, individuals may be concerned about getting "priced out" of the market and thus respond by quickly purchasing a home. In contrast, in the primary specification with fifty-seven MSAs, housing costs are measured at a time when we are certain the individual lived in the MSA, and because prices were not

Table 7.4 Summary of Results from “Differences-in-Differences-in-Differences” Specification

	Independent	Economic	Not Independent	Independent	Economic	Not Independent
Median house price at age twenty-five (\$10,000 change)	-0.0005	0.0002	-0.0010	—	—	—
Monthly house payment at age twenty-five (\$1,000 change)	—	—	—	-0.0031	-0.0020	0.0009
Monthly fair market rent at age twenty-five (\$1,000 change)	0.0222	0.0187	-0.0440*	0.0198	0.0215*	-0.0461*

Source: Author’s calculations.

186 The Price of Independence

appreciating as rapidly, the concern about being priced out is much smaller. Overall, the results from rapidly appreciating MSAs lend support to the idea that the role of housing costs is relatively minor, but because of some severe measurement error issues, it seems that the primary specification that includes all localities is more compelling.

Conclusion

This study explored the role of the cost of living on the living arrangements of young adults. Between 1970 and 2000, dramatically fewer young adults lived independently, with more living with parents, in economic arrangements with others of their generation, or in other arrangements. The differences across decade are most dramatic in the mid-twenties, but even at older ages the percentage living independently has declined. Several factors unrelated to the cost of living, such as marital status and school enrollment, also changed during this time and may help explain these trends.

The main goal of this chapter, however, was to assess how changes in the costs of housing, transportation, and child care have affected these living decisions. The results suggest that housing and transportation costs do impede independent living, although the effects of child care costs are counterintuitive. Nonetheless, these factors appear to explain little of the aggregate changes over the time period analyzed. Rising real housing costs can explain perhaps 15 percent of the total change in independent living arrangements between 1980 and 2000.

As more young adults are “failing to launch,” many have suggested that the recent run-up in housing costs is a likely contributor. However, the decline in independent living appears to have started much earlier than the most recent rise in housing costs. What do the empirical results on housing costs mean for the transition to adulthood going forward from 2000? Although the empirical analysis stops in 2000, the results suggest that it is possible that housing costs will play a far greater role in future analysis.

Between 2000 and 2005, as table 7.5 shows, many areas experienced a real estate boom, with rises in real housing costs that went well beyond the rise from 1980 to 2000. In twenty-five MSAs—almost all in California and Florida—nominal housing prices rose by at least 100 percent. House prices increased 51 percent nationally, while general prices increased by just 13 percent. The median house price in the United States rose by \$65,000 in real terms over this period (National Association of Realtors 2007).

The estimates in this chapter suggest that such large changes in housing costs would lead to fairly sizable changes in living arrangements among young adults. For example, the main results suggest a drop in in-

Young Adults Leaving the Nest 187

Table 7.5 House Price Appreciation from the First Quarter of 2000 to the First Quarter of 2005

1	Santa Barbara–Santa Maria–Goleta, CA	125%
2	Yuba City, CA	124
3	Merced, CA	120
4	Modesto, CA	120
5	San Diego–Carlsbad–San Marcos, CA	119
6	Salinas, CA	119
7	Riverside–San Bernardino–Ontario, CA	118
8	Sacramento–Arden–Arcade–Roseville, CA	114
9	Stockton, CA	113
10	Fresno, CA	112
11	Port St. Lucie–Fort Pierce, FL	111
12	Vallejo–Fairfield, CA	110
13	San Luis Obispo–Paso Robles, CA	109
14	Santa Ana–Anaheim–Irvine, CA	109
15	Los Angeles–Long Beach–Glendale, CA	108
16	Chico, CA	107
17	Oxnard–Thousand Oaks–Ventura, CA	107
18	Fort Lauderdale–Pompano Beach–Deerfield Beach, FL	107
19	Madera, CA	107
20	Napa, CA	106
21	Redding, CA	104
22	Bakersfield, CA	104
23	West Palm Beach–Boca Raton–Boynton Beach, FL	104
24	Ocean City, NJ	103
25	Barnstable Town, MA	102
26	Palm Bay–Melbourne–Titusville, FL	99
27	Miami–Miami Beach–Kendall, FL	98
28	Naples–Marco Island, FL	97
29	Punta Gorda, FL	95
30	Washington–Arlington–Alexandria, DC-VA-MD-WV	95
31	Providence–New Bedford–Fall River, RI-MA	94
32	Vero Beach, FL	93
33	Nassau–Suffolk, NY	92
34	Cape Coral–Fort Myers, FL	92
35	Sarasota–Bradenton–Venice, FL	91
36	Las Vegas–Paradise NV	91
37	Kingston, NY	91
38	Bethesda–Frederick–Gaithersburg, MD	90
39	Oakland–Fremont–Hayward, CA	89
40	Carson City, NV	88
41	Santa Rosa–Petaluma, CA	88
42	Edison, NJ	87
43	Reno–Sparks, NV	87
44	Poughkeepsie–Newburgh–Middletown, NY	86
45	Hanford–Corcoran, CA	85
46	Deltona–Daytona Beach–Ormond Beach, FL	84

188	The Price of Independence	
47	Atlantic City, NJ	83
48	Winchester, VA-WV	80
49	Visalia-Porterville, CA	80
50	Fort Walton Beach-Crestview-Destin, FL	79
	National housing appreciation	51
	CPI = U over same period	13

Source: Author's calculations, based on data from the National Association of Realtors.

dependent living of four percentage points from a baseline rate of 50 percent (in the year 2000), with increases in both living in economic arrangements and non-independently.¹⁹ In addition, minorities were found to be much more responsive to changes in house prices than whites, so independent living should fall by a greater percentage after 2000. The results would also imply that independent living among youth should fall the most in California and Florida, the states that experienced the most dramatic rises in housing costs. These consequences for independent living, unfortunately, cannot be easily tested until the 2010 census is conducted.

Appendix A: Data and Sample

Sample

The 1970 census used two long-form questionnaires, one for a 15 percent sample of the population, the other for a 5 percent sample. For each questionnaire, a 1-in-100 sample was drawn with three different geographic identifiers: county groups, states, and geographic divisions with neighborhood identifiers. I use the 5 percent sample with state identifiers. The 1970 sample does not easily provide MSA identifiers, so there was no compelling reason to use the sample with county-group identifiers rather than state identifiers. Moreover, none of the relevant cost-of-living variables examined here date back as early as 1970. Therefore, young adults from 1970 are not included in the regression analysis but are included to illustrate long-term trends.

I use the 1-in-20 sample for 1980, 1990, and 2000 and restrict the sample to young adults age eighteen to thirty-four in uniquely identified MSAs. This yields a sample size in excess of 4 million observations (before other exclusions).

Living Arrangements

For several reasons, I was unable to create categories of living arrangements that combined housing tenure—owning or renting—with household composition. First, previous studies, such as Frances Goldscheider

and Julie DaVanzo (1985), Roger Avery, Frances Goldscheider, and Alden Speare (1992), and Frances Goldscheider, Arland Thornton, and Linda Young-DeMarco (1993), focus exclusively on the household composition of young adults leaving the nest and do not combine this with housing tenure. Even research that emphasizes economic factors such as local housing costs (for example, Garasky, Haurin, and Haurin 2001) examines only living arrangements, not ownership. William Clark and Clara Mulder (2000) focus more on housing tenure and less on household composition among nest-leavers. They model the decision of young adults who leave their parents' home to own a home, own a trailer, or rent. The authors also separately examine the choice to rent independently or share a rental unit with roommates. Yet none of these studies have examined the simultaneous decision about housing tenure and household composition.

A second possibility is to focus separately on the own-versus-rent decision among young adults. I rejected this approach because it is not always possible to assign the correct ownership status to each of the young adults in the household, especially in households for which there is an economic arrangement. For example, the census 2000 long form (available at <http://www.census.gov/dmd/www/pdf/d02p.pdf>) defines the head of household (person 1) as "the person, or one of the people living here who owns, is buying, or rents this house, apartment, or mobile home. If there is no such person, start with any adult living or staying here." Although it is easy to assign housing tenure to those in "independent" living arrangements (married couples or single individuals living alone), assigning housing tenure to young adults in economic arrangements is more difficult. It is possible that two individuals, related or unrelated, jointly own a home or that one of them is paying rent to the other. Because the census asks these housing questions only at the household level, not the individual level, it is impossible to tell. For this reason, it did not seem worthwhile to pursue this approach.

Metropolitan Statistical Areas

The 1980, 1990, and 2000 censuses identified 272, 273, and 297 MSAs, respectively, with approximately 2.2 million young adults in each of those years. For an MSA to be included, it had to be identified in all three censuses, which narrowed the sample to 224 MSAs. From there, the MSA had to have complete information on the cost-of-living variables. For example, only 139 MSAs have a house price index that dates back to 1980. Similarly, a number of MSAs were missing information on fair market rents or median house prices.

Overall, 91 MSAs had complete information on house price indices, fair market rents, and median house prices, with around 1.3 million

190 The Price of Independence

observations on young adults in each census year. Unfortunately, with such a large sample, I did not have the computational power to estimate the probit models while including MSA fixed effects. I found, however, that by eliminating smaller MSAs (those with fewer than 20,000 observations across the three censuses), I could estimate the models. This criterion leaves 57 MSAs. I have estimated the models at the MSA-year level of aggregation, using all 91 MSAs and three census periods. The basic conclusions on housing prices are unchanged; the models use the individual data in order to compare the effects based on several demographic criteria like race and education. Although a substantial number of MSAs are eliminated, nearly 90 percent of the young adults remain in the sample, yielding a final sample size of 3,636,296.

Estimating Cost-of-Living Variables

Housing Prices As noted, this analysis uses the housing price index. The HPI has several advantages over other available indices. First, it is constructed from a sample of millions of repeat transaction pairs going back thirty years (including both home sales and refinances). In contrast, the constant-quality home price index published by the Commerce Department is based on a sample of only around 12,000 transactions annually.

Second, the HPI is available for many MSAs, whereas the indices published by Fannie Mae or Freddie Mac are available only at the national level and census-division level or for fewer MSAs. OFHEO produces indices for 379 MSAs, with different starting points. The starting points vary because an MSA must have at least 1,000 total transactions before it can be published. In addition, an MSA must have experienced at least ten transactions in any given quarter for that quarterly value of the HPI to be published.

Third, OFHEO describes the HPI as a “constant-quality” house price index. The index for each geographic area is estimated using repeated observations of housing values for individual, single-family residential properties on which at least two mortgages have been originated and subsequently purchased by either Freddie Mac or Fannie Mae since January 1975. In December 1995, the database held more than 6.9 million repeat transactions; more recently, it held 30.7 million transactions. The index is updated each quarter as additional mortgages are purchased by Fannie Mae and Freddie Mac. The new mortgage acquisitions are used to identify repeat transactions for the most recent quarter and for each quarter since the first quarter of 1975. The use of repeat transactions on the same physical property units helps to control for observed and unobserved differences in housing quality. Moreover, lack of information on property characteristics in historical government-sponsored enterprises data precludes the estimation of hedonic house price indexes. The

Young Adults Leaving the Nest 191

HPI methodology is a modified version of the Case-Shiller geometric weighted repeat sales procedure (Case and Shiller 1987, 1989).

Excluded Housing Transactions As indicated in the chapter, many housing transactions are included. However, several are not. The conforming mortgage loan limit for single-family homes in 2006 is \$417,000. Loans whose principal is in excess of this limit (known as “jumbo loans”) are excluded. Mortgages on properties financed by government-insured loans, such as the Federal Housing Administration (FHA) or Veterans Administration (VA) mortgages, are also excluded, as are mortgages on condominiums or multi-unit properties. To the extent that the excluded properties exhibit similar changes in appreciation over time, the HPI should be an accurate measure of housing prices (for more detail, see appendix A). In the regression analysis that follows, I restricted the sample to MSAs that had continuously available HPI data from the first quarter of 1980 to the first quarter of 2000.

Median House Prices With both the HPI and median house prices, the MSAs are as defined according to the U.S. Office of Management and Budget (OMB) and include the specified city or cities and surrounding suburban areas. The median house price data, unlike the HPI, do not control for housing quality. To obtain nominal price levels from 1980 to 2000, I deflate median NAR house prices for the fourth quarter of 2004 by the HPI. Thus, the series of prices is of constant quality, reflecting the quality of the stock of homes sold in 2004. This series of nominal housing prices was then converted into constant 2000 dollars using the Consumer Price Index for all Urban Consumers (CPI-U).

Converting Housing Prices into Monthly Payments One innovation in this study is to recognize the importance of credit market conditions and the federal tax code. Although local housing prices are clearly the main driver of affordability, both interest rates and tax rates play important roles. According to Freddie Mac, interest rates on conforming thirty-year fixed mortgages varied between 6.94 percent in 1998 and 16.63 percent in 1981; the points associated with the mortgages varied between 0.99 points in 1999 and 2.50 points in 1985. These interest rates are available at the national level only. I converted these combinations of interest rates and points into a single interest rate by assuming that 0.90 of a point translated into a 0.25 percent higher interest rate.²⁰ Making this adjustment leads to a time series of interest rates that vary between 7.25 percent and 17.21 percent.

It is also important to recognize that much of the interest on home mortgages is tax-deductible, and that this deduction is more valuable the higher the individual’s marginal tax rate. In the period studied, the

192 The Price of Independence

highest federal marginal tax rate varied between 28 and 70 percent. Of course, it is unrealistic to assume that a typical homeowner—especially a young adult—would face such high marginal rates (and therefore face lower effective housing payments). Although I was unable to find information on marginal tax rates for the median (young) taxpayer, I did obtain from the Congressional Budget Office information on “effective (average) tax rates” on earned income for nonelderly, childless adults from 1979 onward. Although replacing marginal rates with effective rates could dramatically affect monthly housing payments, the empirical results are fairly robust when using either the median house price or the monthly payment computed here. Despite large changes in the tax schedule and taxable income base, effective rates at the federal level stayed in a fairly narrow range, varying from a low of 11.4 percent in 1984 to 13.8 percent in 1981.

Given interest rates and tax rates, I then computed the time series of after-tax monthly payments per \$1,000 of housing value. I relied on first-year amortization calculators from “Mortgage Professor” (<http://www.decisionaide.com/mpcalculators/ExtraPaymentsCalculator/ExtraPayments1.asp>). The monthly payment nets out the tax savings from the deductibility of mortgage interest, a factor that should be fairly important during the initial years of homeownership. On the basis of these schedules, the after-tax monthly payment per \$1,000 of housing value varied between \$6.08 in 1998 and \$12.45 in 1981. I then applied these year-specific payments to each MSA’s housing value to obtain the monthly payment.

Fair Market Rents

To control for conditions in the rental market, which may trend differently from housing prices, I obtained the Department of Housing and Urban Development’s fair market rent series for two-bedroom apartments, available for many metropolitan areas from 1983 through the present. I use fair market rents (FMRs) to gauge gross rent estimates (rent plus all utilities except telephone). I use rents from all units occupied by renters who moved to their present residence within the past fifteen months. HUD combines data from the census, the American Housing Survey, and random digit dialing telephone surveys to determine the FMR.

FMRs are expressed as a percentile point within the distribution of standard-quality rental units. Currently, the fortieth percentile of rent is used, but before 1996 the forty-fifth percentile was used. Because HUD provided both the fortieth and forty-fifth percentiles of rents for each MSA in 1995, I can convert FMRs after 1995 to the forty-fifth percentile by multiplying that year’s FMR by the MSA’s ratio of rents in the forty-fifth

and fortieth percentiles from 1995. Across all MSAs, rents in the forty-fifth percentile were 2.8 percent higher than in the fortieth; the largest difference was 6.7 percent. Because FMRs are unavailable before 1983, I deflate the 1983 numbers for the years 1980 to 1982. Finally, I convert all monthly rents to constant 2000 dollars using the CPI-U.

Transportation Costs

This study controls for transportation costs by deriving commuting-time measures from the 1980 to 2000 public use microdata samples (PUMS). Although transportation costs are often thought of in terms of expenditures on vehicles, insurance, maintenance, and fuel, longer commuting times are likely to be positively correlated with more intensive vehicle use. Moreover, the opportunity cost of an individual's time is itself a cost of commuting. Because it is not possible to obtain expenditures on transportation by locality over time, I use commuting time as a proxy. The census has detailed information on commuting patterns. In each MSA for each census year, I extracted all individuals who drove to work alone in a private vehicle, who worked at least 1,500 hours per year, and who left their home between 6:00 and 10:00 A.M. These restrictions impose a more uniform measure of transportation costs across MSAs and over time. In reality, when congestion goes up, workers find alternative means to avoid these costs, including moving closer to work, relying on public transportation or carpools, and changing their work schedules. Yet these optimizing responses to congestion, which in turn reduce congestion, entail costs in terms of convenience for workers.

I did not measure the direct, out-of-pocket costs of transportation; I speculate that relative to congestion costs, the variation across MSAs is quite minimal. Without data on direct, out-of-pocket transportation costs by MSA, I can only speculate on how they would affect the results. Explicit transportation costs are likely to be positively correlated with the implicit time costs because longer commuting times involve higher fuel consumption, greater wear and tear on vehicles, and higher insurance costs. The inclusion of MSA fixed effects will eliminate permanent fixed differences in commuting costs across localities.

Child Care Costs

To measure child care costs, I extracted all workers from the 1980 to 2000 PUMS who reported their occupation as child care and computed the average hourly wage rate in each MSA and year. I excluded individuals whose imputed wage rate was less than \$1 per hour or greater than \$100 per hour and converted all wage rates into constant 2000 dollars.

Although the wage rate of child care workers is admittedly a rough measure of the costs facing parents, we would expect that higher wage

194 The Price of Independence

rates are positively correlated with higher out-of-pocket costs for parents. An advantage of using a measure derived from the census, rather than relying on measures published elsewhere, is that wage rates vary within an MSA over time. Thus, I control for fixed differences across MSAs and over time. Virtually all published measures of child care costs are at only one point in time, are at the state level rather than the metro level, or sample only a handful of MSAs.

Appendix B: Model and Identification Strategy

The basic model estimates an equation of the form:

$$\begin{aligned} LIVING_ARR^*_{imt} = & \beta_0 + \beta_1 HOUSE_PAY_{imt} + \beta_2 FMR_{imt} + \beta_3 TRAV_{imt} + \\ & \beta_4 CCARE_{imt} + \beta_5 ST_URATE_{imt} + \beta_6 X_{imt} + \beta_7 D_{im} + \beta_8 D_{it} + \varepsilon_{imt} \end{aligned} \quad (7A.1)$$

where equation 7A.1 is the underlying index function for the probit model (and i indexes individuals, m indexes MSAs, and t indexes time). I estimate separate probit models for each living arrangement. Although, in principle, estimating a multinomial logit or multinomial probit would be more desirable (since the living arrangement outcomes are not independent of each other), this was computationally impossible with 3.6 million observations. In the model, $LIVING_ARR^*_{imt}$ is the young adult's living arrangement (independent, economic, or non-independent), $HOUSE_PAY_{imt}$ is either the monthly house payment or the median house price, FMR_{imt} is the fair market rent, $TRAV_{imt}$ is the travel time in minutes, $CCARE_{imt}$ is the average wage of child care workers, and ST_URATE_{imt} is the statewide unemployment rate. Each of the economic variables varies by geographic area and time but not by individual circumstances. X_{imt} contains other covariates that are hypothesized to affect living arrangements and includes controls for age (dummy variables for single years of age), sex, race-ethnicity, educational attainment, current school enrollment, U.S. citizenship, current marital status, whether the individual lived in the same state five years prior to the census, and prior year's earnings. The vectors D_{im} and D_{it} are dummy variables for MSA (fifty-seven separate localities, as shown in table 7A.1) and year (1980, 1990, and 2000). In practice, we do not observe the underlying value of $LIVING_ARR^*_{imt}$; instead, we observe only the discrete outcome:

$$\begin{aligned} LIVING_ARR_{imt} &= 1 \text{ if } LIVING_ARR^*_{imt} \geq 0 \\ LIVING_ARR_{imt} &= 0 \text{ if } LIVING_ARR^*_{imt} < 0 \end{aligned} \quad (7A.2)$$

Assuming that $\varepsilon_{imt} \sim N(0,1)$ and denoting $\Phi(\bullet)$ as the cumulative normal function gives the following probability:

$$prob(LIVING_ARR_{imt}) = \Phi \left(\begin{array}{l} \beta_0 + \beta_1 HOUSE_PAY_{imt} + \beta_2 FMR_{imt} + \beta_3 TRAV_{imt} \\ + \beta_4 CCAR_{imt} + \beta_5 ST_URATE_{imt} + \beta_6 X_{imt} + \beta_7 D_{im} + \beta_8 D_{it} \end{array} \right) \quad (7A.3)$$

When the economic variables and additionally D_{im} and D_{it} are included, the coefficients on $\beta_1 - \beta_5$ provide the difference-in-differences estimate of the impact of the cost of living on living arrangements. The dummy variables for metropolitan area account for long-standing, time-invariant differences between the different metropolitan areas. For example, some areas—such as San Francisco or Boston—persistently have a high cost of living and also tend to have high-paying job opportunities for young adults. Unless these long-standing differences in job opportunities can be adequately controlled for in the empirical models, the likely impact is to bias the effect of housing costs on deterring independent living. That is, good job opportunities, which in this instance are positively correlated with housing costs, also facilitate independent living arrangements. Although the statewide unemployment rate may partially control for these long-standing differences, it is unlikely to fully control for the differences. Thus, without MSA fixed effects, it is possible that the expected negative effect of housing costs on independent living arrangements may not emerge.

The same sorts of arguments could be made about the inclusion of time dummies. For example, national-level credit market conditions have changed over the twenty-year analysis period. The Federal Reserve Bank of San Francisco reports that subprime mortgage lending has grown tremendously since the early 1990s and now constitutes a significant fraction of the overall mortgage market.²¹ Since their short credit histories may make young adults high credit risks, this is a potentially significant change that could facilitate greater independence. In the analysis, real housing prices trended upward by 16 percent from 1980 to 2000; as a result, fewer young adults may be able to afford living independently (and this is borne out). Yet we would expect that the drop in independent living would be even more dramatic if the changing credit market conditions at the national level were accounted for. The inclusion of time dummies accounts for unobserved or hard-to-measure national factors such as this.

With the inclusion of both MSA and time dummies, the estimated impact of the cost of living comes from within-MSA changes in housing costs (and other economic variables) over time. An analysis of variance reveals that roughly 15 percent of the variation in median housing costs comes from the within-MSA variation over time; the remainder is subsumed by MSA and time dummies. A similar analysis reveals that 11 percent of the variation in monthly housing payments and 15 percent of the variation in fair market rents comes from the within-MSA variation over time.

Although much of the variation is subsumed by the fixed effects, it

196 The Price of Independence

may be inappropriate to use such variation to identify the effects of the cost of living on living arrangements in the first place. For example, when I estimate the impact of median house prices on independent living, I find that the coefficient estimate is around one-third smaller without the inclusion of MSA and time dummies.

Although a difference-in-differences estimator provides more compelling evidence than either cross-sectional or time-series estimates, it does have limitations. In particular, if there are factors that change differently across MSAs over time, then it is difficult to distinguish the effect of the cost of living from those other factors. There is no perfect way to address this problem, but as a specification check, I modify the model. In particular, for young adults age twenty-five to thirty-four, I consider how the housing market conditions when they turned twenty-five affected their current living arrangement. This approach can be estimated only for 1990 and 2000 given that housing market information is unavailable prior to 1980. In this case, the variation in the cost of living comes from MSA, year, and age. The motivation for this exercise is twofold. First, other authors, in particular Garasky, Haurin, and Haurin (2001, 333), have noted that an apparent interaction between housing costs and age has an impact on living arrangements. They state that “for older youths (25+), we expect both economic and socio-demographic variables to play significant roles” in living arrangements. Most young adults turning twenty-five have completed their schooling, so it is likely that they are in a position to become independent. Second, I restrict my attention to thirteen of the fifty-seven MSAs that experienced rapid bursts in housing prices, defined as real increases of 30 percent or more in median house prices over a three-year-period. Table 7A.1 indicates these MSAs with an asterisk. Many of these localities are in the Northeast or in California.

Figure 7A.1 shows the trajectories for six of the thirteen MSAs. Some MSAs, such as Honolulu, experienced rapid appreciation and then steep declines in housing prices.²² Others, such as Philadelphia, experienced a burst of appreciation and relatively flat prices thereafter. Notice that these bursts of appreciation occurred at different times in different locations.

Another key point—the intuition behind this identification strategy—is that some young adults might be “in the right place at the right time.” Consider a twenty-five-year-old living in San Francisco in 1986 who was deciding whether to live independently, in an economic arrangement, or with his parents. He would have faced a market in which the median house price was \$260,991. A similar twenty-five-year-old in 1989 would have faced a market in which the median house price was \$399,916, a 50 percent increase. If the cost of living is an important factor for living arrangements, we are likely to observe higher percentages of independent living for the cohorts that happened to face dramatically lower housing prices when they turned twenty-five. Except for differences in initial

Table 7A.1 MSAs Used in Regression Analysis

80—Akron, OH
520—Atlanta—Sandy Springs—Marietta, GA
*640—Austin—Round Rock, TX
720—Baltimore—Towson, MD
1000—Birmingham—Hoover, AL
*1120—Boston—Quincy, MA
1280—Buffalo—Niagara Falls, NY
1520—Charlotte—Gastonia—Concord, NC-SC
1600—Chicago—Naperville—Joliet, IL
1640—Cincinnati—Middletown, OH-KY-IN
1680—Cleveland—Elyria—Mentor, OH
1840—Columbus, OH
1920—Dallas—Plano—Irving, TX
2000—Dayton, OH
2080—Denver—Aurora, CO
2160—Detroit—Livonia—Dearborn, MI
3000—Grand Rapids—Wyoming, MI
3120—Greensboro—High Point, NC
*3320—Honolulu, HI
3360—Houston—Baytown—Sugar Land, TX
3480—Indianapolis, IN
3600—Jacksonville, FL
3760—Kansas City, MO-KS
4120—Las Vegas—Paradise, NV
*4480—Los Angeles—Long Beach—Glendale, CA
4520—Louisville, KY-IN
4920—Memphis, TN-MS-AR
5000—Miami—Miami Beach—Kendall, FL
5080—Milwaukee—Waukesha—West Allis, WI
5120—Minneapolis—St. Paul—Bloomington, MN-WI
5360—Nashville—Davidson—Murfreesboro, TN
*5380—Nassau—Suffolk, NY
5560—New Orleans—Metairie—Kenner, LA
*5600—New York—Wayne—White Plains, NY-NJ
*5640—Newark—Union, NJ-PA
5720—Virginia Beach—Norfolk—Newport News, VA-NC
5880—Oklahoma City, OK
5960—Orlando, FL
*6160—Philadelphia, PA
6200—Phoenix—Mesa—Scottsdale, AZ
6280—Pittsburgh, PA
6440—Portland—Vancouver—Beaverton, OR-WA
6760—Richmond, VA
6780—Riverside—San Bernardino—Ontario, CA
6840—Rochester, NY
*6920—Sacramento—Arden—Arcade—Roseville, CA

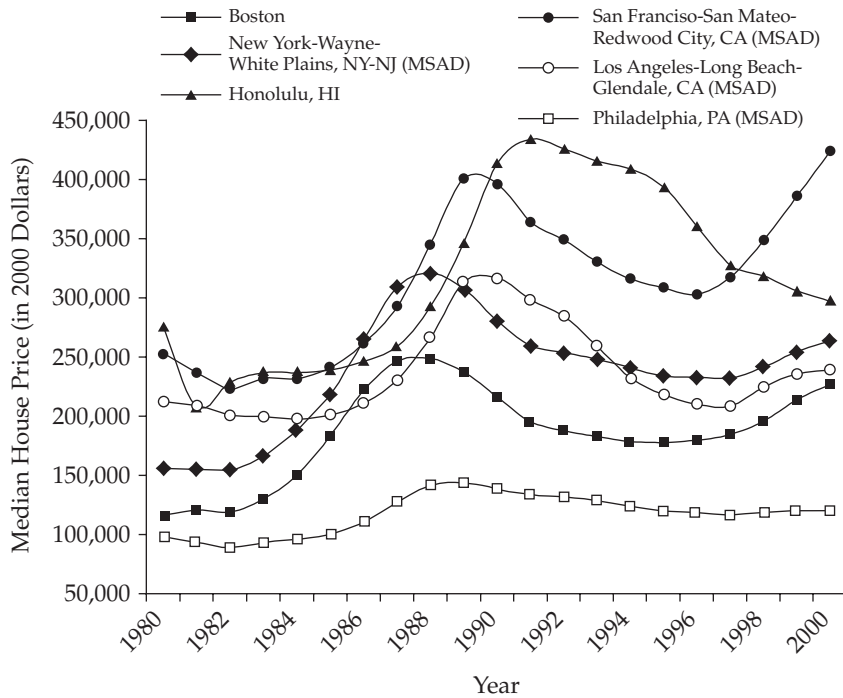
198 The Price of Independence

- 7040—St. Louis, MO-IL
- *7160—Salt Lake City, UT
- 7240—San Antonio, TX
- *7320—San Diego—Carlsbad—San Marcos, CA
- *7360—San Francisco—San Mateo—Redwood City, CA
- *7600—Seattle—Bellevue—Everett, WA
- 8160—Syracuse, NY
- 8280—Tampa—St. Petersburg—Clearwater, FL
- 8400—Toledo, OH
- 8520—Tucson, AZ
- 8840—Washington—Arlington—Alexandria, DC-VA-MD-WV

Source: Author's calculations.

*An MSA that experienced rapidly rising housing prices over a three year period. Overall, of the 91 MSAs that satisfied other criteria, these MSAs also had at least 20,000 young adults in them when combining the 1980 to 2000 census PUMS files.

Figure 7A.1 Examples of Rapid Escalation in Housing Prices (30 Percent or More Real Appreciation over Three Years)



Source: Author's calculations, based on data from the National Association of Realtors and Office of Federal Housing Enterprise Oversight.

Table 7A.2 Full Results: Probit Models on Living Arrangements, Differences-in-Differences Specification

	(1) Independent	(2) Economic	(3) Not Independent	(4) Independent	(5) Economic	(6) Not Independent
Median house price	-0.0156 (0.0020) [-0.0061]	0.0076 (0.0021) [0.0011]	0.0072 (0.0028) [0.0021]	—	—	—
Monthly house payment	—	—	—	-0.1493 (0.0303) [-0.0584]	0.1570 (0.0234) [0.0221]	0.0139 (0.0396) [0.0041]
Monthly fair market rent	0.0184 (0.0944) [0.0072]	0.3215 (0.1007) [0.0453]	-0.2794 (0.1309) [-0.0824]	-0.1169 (0.1198) [-0.0457]	0.2567 (0.0831) [0.0362]	-0.1259 (0.1367) [-0.0371]
Average travel time in minutes	-0.0127 (0.0051) [-0.005]	-0.0185 (0.0047) [-0.0026]	0.0163 (0.0080) [0.0048]	-0.0166 (0.0053) [-0.0065]	-0.0164 (0.0044) [-0.0023]	0.0178 (0.0081) [0.0052]
Average wage of child care workers	0.0149 (0.0065) [0.0058]	0.0105 (0.0071) [0.0015]	-0.0238 (0.0094) [-0.007]	0.0146 (0.0077) [0.0057]	0.0049 (0.0068) [0.0007]	-0.0200 (0.0101) [-0.0059]
Statewide unemployment rate	-0.0231 (0.0064) [-0.0091]	-0.0205 (0.0053) [-0.0029]	0.0331 (0.0082) [0.0098]	-0.0258 (0.0072) [-0.0101]	-0.0128 (0.0047) [-0.0018]	0.0304 (0.0084) [0.009]
Male	-0.3949 (0.0068) [-0.1536]	0.1248 (0.0083) [0.0176]	0.2786 (0.0099) [0.0823]	-0.3946 (0.0069) [-0.1535]	0.1248 (0.0083) [0.0176]	0.2784 (0.0099) [0.0822]
Hispanic	-0.1566 (0.0290) [-0.0618]	-0.0644 (0.0275) [-0.0088]	0.2252 (0.0386) [0.0707]	-0.1577 (0.0290) [-0.0622]	-0.0640 (0.0275) [-0.0087]	0.2260 (0.0386) [0.0709]
African American or black	0.1323 (0.0145)	-0.3955 (0.0143)	0.1784 (0.0182)	0.1325 (0.0146)	-0.3960 (0.0144)	0.1786 (0.0182)

Table 7A.2 (Continued)

	(1)		(2)		(3)		(4)		(5)		(6)	
	Independent	Economic	Independent	Economic	Not Independent	Not Independent	Independent	Economic	Economic	Not Independent	Not Independent	
Other nonwhite	[0.0512] -0.1950	[-0.0453] (0.1547)	[0.0552] 0.3093	[-0.0453] (0.1547)	[0.0512] -0.1977	[0.0552] 0.3093	[0.0512] -0.1977	[-0.0453] (0.1535)	[-0.0453] (0.1535)	[0.0553] 0.3110	[0.0553] 0.3110	
Currently married	[0.0216] [-0.0772] 1.9048	(0.0223) [-0.0197] -1.6005	(0.0334) [0.1004] -1.2476	(0.0223) [-0.0197] -1.6005	[0.0217] [-0.0782] 1.9042	(0.0334) [0.1004] -1.2476	[0.0217] [-0.0782] 1.9042	[-0.0196] [-0.0196] -1.6007	[-0.0196] [-0.0196] -1.6007	[0.0335] [0.101] -1.2473	[0.0335] [0.101] -1.2473	
High school dropout	[0.0196] [0.6381] -0.0108	(0.0237) [-0.2244] -0.0367	(0.0318) [-0.3426] 0.0230	(0.0237) [-0.2244] -0.0367	(0.0197) [0.638] -0.0109	(0.0318) [-0.3426] 0.0230	(0.0197) [0.638] -0.0109	(0.0237) [-0.2244] -0.0366	(0.0237) [-0.2244] -0.0366	[0.0318] [-0.3426] 0.0231	[0.0318] [-0.3426] 0.0231	
Some college	[0.0112] [-0.0042] 0.0781	(0.0112) [-0.0051] 0.1630	(0.0119) [0.0068] -0.2165	(0.0112) [-0.0051] 0.1630	(0.0113) [-0.0043] 0.0784	(0.0119) [0.0068] -0.2165	(0.0113) [-0.0043] 0.0784	(0.0112) [-0.0051] 0.1632	(0.0112) [-0.0051] 0.1632	[0.0119] [0.0069] -0.2168	[0.0119] [0.0069] -0.2168	
Enrolled in school	(0.0042) [0.0306] -0.1263	(0.009) [0.0227] -0.0558	(0.0084) [-0.0644] 0.1211	(0.009) [0.0227] -0.0558	(0.0041) [0.0307] -0.1264	(0.0084) [-0.0644] 0.1211	(0.0041) [0.0307] -0.1264	(0.0090) [0.0227] -0.0557	(0.0090) [0.0227] -0.0557	[0.0083] [-0.0645] 0.1213	[0.0083] [-0.0645] 0.1213	
Lived in same state five years ago	[0.0064] [-0.0497] -0.3650	(0.0101) [-0.0077] -0.5981	(0.0115) [0.0367] 0.7473	(0.0101) [-0.0077] -0.5981	(0.0064) [-0.0497] -0.3654	(0.0115) [0.0367] 0.7473	(0.0064) [-0.0497] -0.3654	(0.0101) [-0.0077] -0.5986	(0.0101) [-0.0077] -0.5986	[0.0115] [0.0367] 0.7479	[0.0115] [0.0367] 0.7479	
U.S. citizen	[0.0348] [-0.1429] 0.2198	(0.0575) [-0.0785] -0.4846	(0.0655) [0.2304] 0.1905	(0.0575) [-0.0785] -0.4846	(0.0348) [-0.1431] 0.2203	(0.0655) [0.2304] 0.1905	(0.0348) [-0.1431] 0.2203	(0.0574) [-0.0786] -0.4836	(0.0574) [-0.0786] -0.4836	[0.0654] [0.2306] 0.1893	[0.0654] [0.2306] 0.1893	
Individual earnings	(0.0203) [0.0870] 7.5313	(0.0190) [-0.0898] 1.5193	(0.0198) [0.0527] -12.3256	(0.0190) [-0.0898] 1.5193	(0.0203) [0.0872] 7.5025	(0.0198) [0.0527] -12.3256	(0.0203) [0.0872] 7.5025	(0.019) [-0.0895] 1.5073	(0.019) [-0.0895] 1.5073	[0.0198] [0.0524] -12.2892	[0.0198] [0.0524] -12.2892	
	(0.4220) [2.9453]	(0.1877) [0.2141]	(0.4609) [-3.6365]	(0.1877) [0.2141]	(0.4218) [2.9341]	(0.4609) [-3.6365]	(0.4218) [2.9341]	(0.1859) [0.2124]	(0.1859) [0.2124]	(0.4609) [-3.6261]	(0.4609) [-3.6261]	

Source: Author's calculations.

Notes: Sample size in all specifications is 3,636,296. All models estimated as probit models. Standard errors in parentheses and marginal effects in brackets. In addition to the variables shown, all models include single-year-of-age dummies, MSA dummies, year dummies, and a constant term and correct for clustering at the MSA-year level. Median house price is divided by 10,000, monthly house payment and fair market rent are divided by 1,000, and individual earnings are divided by 1,000,000.

Table 7A.3 Full Results: Housing Market Conditions at Age 25—Rapid Appreciation, Differences-in-Differences-in-Differences Specification

	Independent	Economic	Not Independent	Independent	Economic	Not Independent
Median house price at age twenty-five	-0.0013 (0.0009) [-0.0005]	0.0010 (0.0011) [0.0002]	-0.0010 (0.0011) [-0.0002]	—	—	—
Monthly house payment at age twenty-five	—	—	—	-0.0085 (0.0115) [-0.0031]	-0.0116 (0.0130) [-0.002]	0.0043 (0.0128) [0.0009]
Monthly fair market rent at age twenty-five	0.0619 (0.0374) [0.0222]	0.1099 (0.0594) [0.0187]	-0.2075 (0.0524) [-0.044]	0.0550 (0.0372) [0.0198]	0.1267 (0.0573) [0.0215]	-0.2175 (0.0503) [-0.0461]
Male	-0.3806 (0.0076) [-0.1363]	0.2266 (0.0088) [0.0387]	0.2659 (0.0083) [0.0566]	-0.3806 (0.0076) [-0.1363]	0.2266 (0.0088) [0.0387]	0.2659 (0.0083) [0.0566]
Hispanic	-0.1466 (0.0147) [-0.0537]	-0.0808 (0.0148) [-0.0133]	0.2782 (0.0212) [0.0650]	-0.1466 (0.0147) [-0.0537]	-0.0807 (0.0148) [-0.0133]	0.2781 (0.0212) [0.0649]
African American or black	0.0750 (0.0172) [0.0266]	-0.3839 (0.0120) [-0.0531]	0.2642 (0.0138) [0.0628]	0.0750 (0.0172) [0.0266]	-0.3839 (0.0120) [-0.0531]	0.2642 (0.0138) [0.0628]
Other nonwhite	-0.2957 (0.0115) [-0.1109]	-0.0988 (0.0165) [-0.016]	0.4605 (0.0172) [0.1175]	-0.2957 (0.0115) [-0.1109]	-0.0988 (0.0165) [-0.016]	0.4604 (0.0172) [0.1175]
Currently married	1.765 (0.0185) [0.5837]	-1.6213 (0.0203) [-0.3067]	-0.9954 (0.0175) [-0.2192]	1.765 (0.0185) [0.5837]	-1.6213 (0.0203) [-0.3067]	-0.9954 (0.0175) [-0.2192]

Table 7A.3 (Continued)

	Independent	Economic	Not Independent	Independent	Economic	Not Independent
High school dropout	-0.0221 (0.0103) [-0.008]	-0.0001 (0.0118) [-0.0001]	0.0155 (0.0106) [0.0033]	-0.0221 (0.0103) [-0.008]	-0.0001 (0.0118) [-0.0001]	0.0155 (0.0106) [0.0033]
Some college	0.0944 (0.0073) [0.0341]	0.1277 (0.0092) [0.0212]	-0.2026 (0.0081) [-0.0445]	0.0944 (0.0073) [0.0341]	0.1277 (0.0092) [0.0212]	-0.2026 (0.0081) [-0.0445]
Enrolled in school	-0.0459 (0.0069) [-0.0166]	0.0101 (0.0075) [0.0017]	0.0267 (0.0096) [0.0057]	0.0459 (0.0069) [-0.0166]	0.0101 (0.0075) [0.0017]	0.0268 (0.0096) [0.0057]
Lived in same state five years ago	-0.4748 (0.0199) [-0.1755]	-0.7996 (0.03) [-0.114]	1.0341 (0.0308) [0.2653]	-0.4748 (0.0199) [-0.1755]	-0.7996 (0.03) [-0.114]	1.0341 (0.0308) [0.2653]
U.S. citizen	0.2087 (0.0152) [0.0771]	-0.4081 (0.0137) [-0.0824]	0.1055 (0.0128) [0.0215]	0.2087 (0.0152) [0.0771]	-0.4081 (0.0137) [-0.0824]	0.1055 (0.0128) [0.0215]
Individual earnings in prior year	4.8308 (0.1662) [1.7355]	-0.0066 (0.1212) [-0.0011]	-9.0739 (0.2665) [-1.9252]	4.8308 (0.1662) [1.7355]	-0.066 (0.1212) [-0.0011]	-9.0739 (0.2665) [-1.9252]

Source: Author's calculations.

Notes: Sample size in all specifications is 50,593. Sample is restricted to young adults who are age twenty-five to thirty-four in one of the thirteen MSAs that experienced rapid price appreciation (30 percent or more in real terms over three years) and are in the 1990 or 2000 census PUMS: Boston-Quincy, MA, Honolulu, HI, Los Angeles-Long Beach-Glendale, CA, Nassau-Suffolk, NY, New York-Wayne-White Plains, NY-NJ, Newark-Union, NJ-PA, Philadelphia PA, Austin-Round Rock, TX, Sacramento-Arden-Arcade-Roseville, CA, Salt Lake City, UT, San Diego-Carlsbad-San Marcos, CA, San Francisco-San Mateo-Redwood City, CA, and Seattle-Bellevue-Everett, WA. Standard errors in parentheses and marginal effects in brackets. In addition to the variables shown, all models include MSA* year interactions, MSA* age interactions, year* age interactions, and a constant term and correct for clustering at the MSA* year* age level. Median house price is divided by 10,000, and monthly house payment and fair market rent are divided by 1,000. The average travel time to work, average wage of child care workers, and state unemployment rates are not included because the specification already includes MSA* year interactions.

housing costs, most other factors, such as the current health of the local job market or lending market conditions at the national level, should be quite similar when we observe young adults in 1990 or 2000.

By using housing conditions at age twenty-five rather than during the census year, equation 7A.1 is now modified as:

$$LIVING_ARR_{imt}^* = \beta_0 + \beta_1 HOUSE_PAY_25_{imt} + \beta_2 FMR_25_{imt} + \beta_3 X_{imt} + \beta_4 D_{im} D_{it} + \beta_5 D_{it} D_{ia} + \beta_6 D_{it} D_{ia} + \epsilon_{imt} \quad (7A.1)$$

This specification includes MSA*time interactions, as well as MSA*age and time*age interactions (D_{ia} represents age dummies). The variation in travel time, child care costs, and the unemployment rate are subsumed by the MSA*time interactions. The coefficients $\beta_1 - \beta_2$ now represent the “triple differences” estimate of the impact of the cost of living.

The author would like to thank Sandy Korenman, Sheldon Danziger, Ceci Rouse, and conference participants for helpful comments.

Notes

1. See Time Poll, “Inside the World of the Twixters,” available at: <http://www.time.com/time/covers/1101050124/graphic/>.
2. Much of the study focuses on housing costs rather than child care or transportation costs because of the availability of high-quality data. These other costs are probably important for the transition to adulthood as well, but the lack of a long time series makes it more difficult to come to firm conclusions.
3. By ending in 2000, however, the analysis stops short of the recent escalation in housing prices.
4. Roger Avery, Frances Goldscheider, and Alden Speare (1992) find that the effects of parental resources on leaving-home decisions differ depending on the route out of the home (marriage versus living alone or with roommates). Goldscheider, Arland Thornton, and Linda Young-DeMarco (1993) find that the transition to full residential independence among Detroit youth is gradual. Finally, William Clark and Clara Mulder (2000) find that independence in the housing market is closely related to the size and regional location of the housing market. In addition, the young adult’s resources are an important influence on housing-market entry.
5. Specifically, a 10 percent increase in the relative cost of ownership reduces the likelihood of ownership by 7.1 percent.
6. Other authors in this volume (in particular, Hill and Holzer) define “living arrangements” somewhat differently, as does Jordan Matsudaira (2006). For example, Matsudaira’s key dependent variable is “fraction of young adults living with at least one parent.” This is very similar to my category “not independent.” Living away from parents need not signal a complete transi-

204 The Price of Independence

tion to adulthood, however, and it is unclear ex-ante whether higher housing costs affect only living with parents. Later results show that higher housing costs reduce the likelihood of living in a nuclear family arrangement and increase the likelihood of living in an economic arrangement. This type of household adjustment would be missed by a focus only on whether a young adult is living with parents.

7. I tried classifying young adults by both living arrangements and homeownership status. For reasons discussed later, I abandoned this approach and focused exclusively on living arrangements.
8. Although the “economic arrangement” group could be thought of as roommates, cohabitators without children would fall into this group as well. I put cohabitators with children into the “other” category and exclude them from the analysis. If, instead, cohabitators with children are classified as “independent,” then the empirical findings hardly change.
9. The fraction of young adults who fall into the “other” category uniformly increases over time, from about 7 to 15 percent; most of the increase occurred between 1980 and 2000. Some of this change is due to cohabitators with children. This classification does not, however, affect the empirical results.
10. Many young adults probably buy starter homes or condominiums that cost less than the median house price. Unfortunately, the NAR data do not have other percentiles in the housing distribution. Changes in house prices by percentile are correlated with each other, so the differential responsiveness may be because of socioeconomic status.
11. For the sample of MSAs I examine, holding quality constant and adjusting for inflation, prices fell in real terms. Consider the OFHEO data for the entire United States (http://www.ofheo.gov/media/pdf/3q06_hpi_reg.xls). In the first quarter of 1990, the index was 170.83. By the first quarter of 2000, this quality-constant index had increased to 231.86. Thus, nominal appreciation over the decade for the entire country was 35.7 percent (or an annual nominal appreciation of 3.1 percent). According to table B-60 of *The Economic Report of the President 2006* (accessed at <http://www.whitehouse.gov/cea/erp06.pdf>, page 351), the CPI stood at 130.7 in 1990 and at 172.2 in 2000. This represents a 31.7 percent increase in prices, or 2.7 percent annual inflation. Thus, for the entire United States, there was a trivial change in real housing prices. Since the actual sample used in this study includes a number of metropolitan areas that had run-ups in housing prices going into 1990 (and severe falls in the early to mid-1990s), it is plausible that real, constant-quality prices fell.
12. It may appear surprising that housing payments fell, given the rise in nominal house prices, but interest rates fell from 14.2 percent in 1980 to 8.3 percent in 2000. In addition, *real* housing prices rose only modestly over the period.
13. The results on commuting time appear to be implausibly large. A \$15,000 increase in house prices has the same effect on independence as a two-minute increase in commuting time. The results on housing prices are unaffected, however, by excluding commuting time. For example, a \$10,000 change in median house price leads to a 0.64-percentage-point decline in independent living, rather than 0.61 percentage points.

14. It could also be the case that the unemployment rate, commuting times, and child care wages all tend to be correlated with each other in a way that affects the living arrangements of young adults.
15. Although same-state-of-residence is arguably endogenous, the results on house prices actually get larger by excluding it. A \$10,000 change in house price leads to a 0.70-percentage-point decline in independent living.
16. One approach to dealing with the endogeneity of location is to construct an instrumental variable based on the person's birthplace. Unfortunately, this is hard to do in my analysis since I would need to know the MSA, not the state, where the individual was born. The census asks only for state of birth, not city of birth.
17. The results for all alternative specifications are available from the author.
18. According to the credit service FICO (<http://www.myfico.com>), credit scores do not explicitly incorporate race, color, religion, national origin, sex, marital status, or age.
19. One mitigating factor would be the fall in interest rates since 2000. As a consequence, the monthly housing payment would not rise as rapidly as median house prices.
20. This trade-off between the interest rate and points is justified by casual inspection of thirty-year mortgage loan combinations on www.eloan.com.
21. See Lederman 2001.
22. Although Honolulu may be different from other localities for a variety of reasons, the specifications include MSA fixed effects to account for those differences.

References

- Avery, Roger, Frances Goldscheider, and Alden Speare Jr. 1992. "Feathered Nest/Gilded Cage: Parental Income and Leaving Home in the Transition to Adulthood." *Demography* 29(3, August): 375-88.
- Case, Karl E., and Robert J. Shiller. 1987. "Prices of Single Family Real Estate Prices." *New England Economic Review* (September): 45-56.
- . 1989. "The Efficiency of the Market for Single-Family Homes." *American Economic Review* 79(1): 125-37.
- Clark, William, and Clara H. Mulder. 2000. "Leaving Home and Entering the Housing Market." *Environment and Planning A* 32(9, September): 1657-71.
- Garasky, Steven, R. Jean Haurin, and Donald R. Haurin. 2001. "Group Living Decisions as Youths Transition to Adulthood." *Journal of Population Economics* 14(2): 329-49.
- Goldscheider, Frances, and Julie DaVanzo. 1985. "Living Arrangements and the Transition to Adulthood." *Demography* 22(4): 545-63.
- Goldscheider, Frances, Arland Thornton, and Linda Young-DeMarco. 1993. "A Portrait of the Nest-Leaving Process in Early Adulthood." *Demography* 30(4): 683-99.
- Haurin, Donald R., Patric H. Hendershott, and Dongwook Kim. 1993. "The Impact of Real Rents and Wages on Household Formation." *Review of Economics and Statistics* 75(2): 284-93.

206 The Price of Independence

- . 1994. "Housing Decisions of American Youth." *Journal of Urban Economics* 35(1): 28–45.
- Lederman, Elizabeth. 2001. "Subprime Mortgage Lending and the Capital Markets." Federal Reserve Bank of San Francisco. FRBSF Economic Letter 2001-38. December 28, 2001. Accessed at <http://www.frbsf.org/publications/economics/letter/2001/el2001-38.pdf>.
- Matsudaira, Jordan. 2006. "Economic Conditions and the Living Arrangements of Young Adults." Network on Transitions to Adulthood Working Paper, May 2006. Accessed at <http://www.transad.pop.upenn.edu/downloads/matsudaira.pdf>.
- National Association of Realtors. 2007. "Median Sales Price of Existing Single-Family Homes for Metropolitan Areas." Accessed at [http://www.realtor.org/Research.nsf/files/MSAPRICESF.pdf/\\$FILE/MSAPRICESF.pdf](http://www.realtor.org/Research.nsf/files/MSAPRICESF.pdf/$FILE/MSAPRICESF.pdf).
- U.S. Department of Commerce. Bureau of the Census. 1971. *Census of Population and Housing, 1970 (United States): Public Use Samples* (computer file). Washington: U.S. Bureau of the Census (producer); Ann Arbor, Mich.: Inter-university Consortium for Political and Social Research (distributor, 1991).
- . 1985. *Census of Population and Housing, 1980 (United States): Public Use Microdata Sample (a Sample): 5 Percent Sample (Puerto Rico)* (computer file). ICPSR version. Washington: U.S. Bureau of the Census (producer); Ann Arbor, Mich.: Inter-university Consortium for Political and Social Research (distributor, 1997).
- . 1995. *Census of Population and Housing, 1990 (United States): Public Use Microdata Sample: 5 Percent Sample* (computer file). 3rd ICPSR release. Washington: U.S. Bureau of the Census (producer); Ann Arbor, Mich.: Inter-university Consortium for Political and Social Research (distributor, 1996).
- . 2003. *Census of Population and Housing, 2000 (United States): Public Use Microdata Sample: 5 Percent Sample* (computer file). ICPSR release. Washington: U.S. Bureau of the Census (producer); Ann Arbor, Mich.: Inter-university Consortium for Political and Social Research (distributor, 2003).