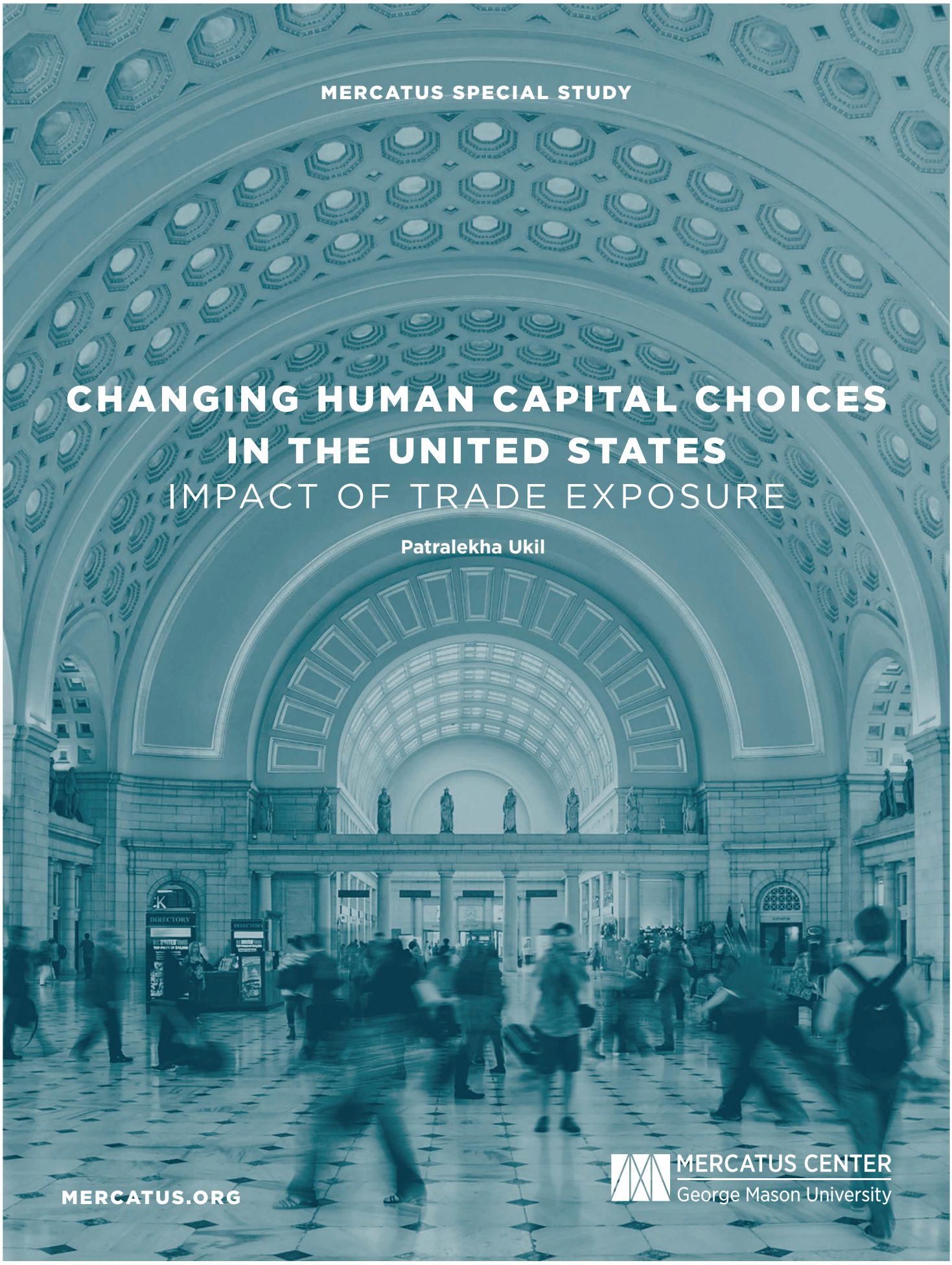

Patralekha Ukil, "Changing Human Capital Choices in the United States: Impact of Trade Exposure," Mercatus Special Study, Mercatus Center at George Mason University, Arlington, VA, May 2022.

ABSTRACT

This paper investigates the impact of trade-induced changes in local economic conditions on individual decisions related to human capital accumulation in the United States. Existing research has found that business cycle and economic fluctuations impact investments in higher education, both cyclically and countercyclically. However, there is not enough evidence of such impact on different human capital accumulation decisions, specifically in investments toward attaining job skills, or specific investments in worker retraining or job-readiness training. This paper utilizes the biennial panel structure of the March Current Population Survey data to follow individual transitions to different training decisions across time and exploits yearly variation in negative shocks to industries in US commuting zones. Results suggest that increasing import penetration in local labor markets have led to a positive impact on individual transitions to job training aimed at increasing worker skills, but these results seem to be mostly driven by the females in such regions.

JEL codes: F14, F16, F61, I20, I23, I25

Keywords: Chinese imports, endogenous human capital, globalization, higher education, import competition, job training, manufacturing decline, trade exposure

INTRODUCTION

Human capital accumulation and such investments involve considerable opportunity costs for individuals, primarily operating via forgone earnings and income. Economic theory suggests that individuals may increase such investments when the opportunity cost associated with such investments reduces, such as during negative labor market shocks, recessions, trade-induced layoffs or unemployment, and so forth. Exposure from international trade, on an average, generates gains for countries and workers. However, recent research has documented the losses brought about by increased trade exposure, consistent with what theory would predict, coupled by automation and technological change, to specific groups of individuals. Increased trade exposure in local labor markets in the United States has led to labor market adjustments and shocks, which have resulted in a decrease in the incomes of workers with no college education, relative to the income of workers who have a college degree.[1] Policymakers and governments of several countries are now interested in policies that address different forms of training, education, and skill formation, specifically those related to providing job skills to workers after they graduate from school.[2] In this paper, I examine whether individuals residing in local labor markets heavily affected by manufacturing trade shocks make choices to retrain themselves for the changing labor market structures. I investigate individual transitions to training services aimed at worker retraining or skill accumulation in US commuting zones (CZs) negatively affected by import penetration.

The research in this paper contributes to the overall literature on human capital and globalization, primarily on the welfare implications of trade-induced manufacturing decline, labor market adjustments, and shocks on low-skilled workers. The majority of empirical studies on the impact of trade exposure on human capital accumulation has focused on developing countries and has found

1. David H. Autor, David Dorn, and Gordon H. Hanson, "The China Syndrome: Local Labor Market Effects of Import Competition in the United States," *American Economic Review* 103, no. 6 (2013); David H. Autor, David Dorn, and Gordon H. Hanson, "The China Shock: Learning from Labor-Market Adjustment to Large Changes in Trade," *Annual Review of Economics* 8 (2016); Ryan Kim and Jonathan Vogel, "Trade and Inequality across Local Labor Markets: The Margins of Adjustment" (Working Paper, UCLA, 2018); David Autor, "Work of the Past, Work of the Future" (NBER Working Paper No. w25588. National Bureau of Economic Research, Cambridge, MA, February 2019).

2. United States Department of Education, *Investing in America's Future: A Blueprint for Transforming Career and Technical Education* (Streamwood, IL: Poplar Creek Public Library, 2012); United States Department of Education, *Carl D. Perkins Career and Technical Education Act, 2018*; European Commission, *Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth* (Brussels: European Commission, 2010).

results that indicate that individuals in developing nations choose to invest away from education whenever labor market opportunities get better or the cost of schooling increases. Edmonds, Pavcnik, and Topalova investigate Indian districts after the country's landmark 1991 trade liberalization and find smaller increases in school attendance among students living in those districts that were most affected by the reductions in tariffs and thus received improved labor market outcomes.[3] Similarly, looking at the changes in human capital decisions as a response to the skill requirements of future job prospects, Oster and Steinberg find that openings for "skilled" jobs led to an increase in primary school enrollment in India.[4] In a very important contribution, Blanchard and Olney utilize a panel of more than 100 nations spanning over nearly 50 years to study the impact of the composition of exports on human capital accumulation.[5] The authors use a gravity model to isolate an exogenous variation in the skill intensity of exports and find that increases in a country's skill-intensive exports lead to an increase in educational attainment, while an increase in the agricultural or low-skill manufacturing exports correspondingly decrease educational attainment. Atkin finds a reduction in school attendance, increased dropout rates, and a lower education attainment in Mexico following a substantial increase in formalized jobs after the country experienced expansions in manufacturing industries that were exports focused.[6]

This study also contributes to the literature on worker training programs, vocational education, and occupational training for reemployment. However, much of this literature has focused on whether training leads to higher quality job matches and not on the question of whether individuals seek training when facing negative labor market outcomes.[7] In this context, considerable research has focused on the benefits of vocation education or training vis-à-vis general

3. Eric V. Edmonds, Nina Pavcnik, and Petia Topalova, "Trade Adjustment and Human Capital Investments: Evidence from Indian Tariff Reform," *American Economic Journal: Applied Economics* 2, no. 4 (2010).
4. Emily Oster and Bryce Millett Steinberg, "Do IT Service Centers Promote School Enrollment? Evidence from India," *Journal of Development Economics* 104 (2013).
5. Emily J. Blanchard and William W. Olney, "Globalization and Human Capital Investment: Export Composition Drives Educational Attainment," *Journal of International Economics* 106 (2017).
6. David Atkin, "Endogenous Skill Acquisition and Export Manufacturing in Mexico," *American Economic Review* 106, no. 8 (2016).
7. For example, Jooyoun Park, "Does Occupational Training by the Trade Adjustment Assistance Program Really Help Reemployment? Success Measured as Occupation Matching," *Review of International Economics* 20, no. 5 (2012); Leah E. Marcal, "Does Trade Adjustment Assistance Help Trade-Displaced Workers?" *Contemporary Economic Policy* 19, no. 1 (2001); and Robert J. LaLonde, "The Promise of Public Sector-Sponsored Training Programs," *Journal of Economic Perspectives* 9, no. 2 (1995).

education on labor market outcomes. This literature has provided some evidence that there could be tradeoffs between the short-term benefits of vocational training and the longer-term negative effects and that any earnings gains from vocational education could dissipate early in a worker's career.[8] Research carried out in the Netherlands and Sweden have found no such positive impacts of vocational education on labor market outcomes,[9] while a study in Norway using a nationwide reform finds that vocational education increased earnings for those who chose to enter into it.[10] Silliman and Virtanen use a regression discontinuity design in the admissions procedure in Finland and find that vocational education increased the initial earnings and that this earnings gain for the workers was persistent.[11] More importantly, the authors find that admission into the vocational education versus the general educational track did not increase the probability of working in those employment sectors that were at risk of facing offshoring or automation.

Two recent studies are the most closely related to this paper. Greenland and Lopresti, exploiting the geographic variation in the exposure to trade shocks in the United States find that increased Chinese import competition in CZs from 1990 to 2007 led to large increases in high school graduation rates, especially in those areas most impacted by import competition.[12] Ferriere, Navarro, and Reyes-Heroles also exploit a similar empirical methodology and show that increased import penetration shocks across local labor markets in the United States led to an increase in average college enrollment.[13] The authors also find that this increase is largely driven by individuals coming from richer households.

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8. Eric A. Hanushek, Guido Schwerdt, Ludger Woessmann, and Lei Zhang, "General Education, Vocational Education, and Labor-Market Outcomes over the Lifecycle," *Journal of Human Resources* 52, no. 1 (2017); Franziska Hampf and Ludger Woessmann, "Vocational vs. General Education and Employment over the Life Cycle: New Evidence from PIAAC," *CESifo Economic Studies* 63, no. 3 (2017).
9. Hessel Oosterbeek and Dinand Webbink, "Wage Effects of an Extra Year of Basic Vocational Education," *Economics of Education Review* 26, no. 4 (2007); Caroline Hall, "Does More General Education Reduce the Risk of Future Unemployment? Evidence from an Expansion of Vocational Upper Secondary Education," *Economics of Education Review* 52 (2016).
10. Marianne Bertrand, Magne Mogstad, and Jack Mountjoy, "Improving Educational Pathways to Social Mobility: Evidence from Norway's Reform 94," *Journal of Labor Economics* 39, no. 4 (2021).
11. Mikko Silliman and Hanna Virtanen, "Labor Market Returns to Vocational Secondary Education," *American Economic Journal: Applied Economics* 14, no. 1 (2022).
12. Andrew Greenland and John Lopresti, "Import Exposure and Human Capital Adjustment: Evidence from the US," *Journal of International Economics* 100 (2016).
13. Axelle Ferriere, Gaston Navarro, and Ricardo Reyes-Heroles, "Escaping the Losses from Trade: The Impact of Heterogeneity on Skill Acquisition," in *2018 Meeting Papers*, vol. 1248 (Society for Economic Dynamics, 2018).

An important distinction in this paper is that it focuses on *job training* and that, instead of looking at CZ-level average outcome variables such as average graduation rates and college attendance rates, this paper focuses on *transitions* made by individuals who are residing in regions impacted by such import penetration shocks. To facilitate the investigation of such short-term individual decision-making, I create yearly measures of local labor market exposures to import competition at the per-capita level. Investigating such individual decision-making is important, especially in the context of economic mobility and policy, because it is worth examining whether individuals who have faced long-term and persistent economic shocks continue to remain in cycles of poverty or if they make decisions themselves that might help to break such cycles.

Results suggest that individuals residing in US CZs negatively impacted by trade exposure do make transitions to job skill and job readiness trainings. One standard deviation increase in the import penetration measure in the local labor market leads to an almost 0.4 percentage point increase in the transition to worker training overall. The results are largely driven by females for whom one standard deviation increase in the import penetration measure in the local labor market leads to an almost 0.8 percentage point increase in the transition to worker training. Further heterogeneity analyses by the variation in gender-specific levels of import penetration suggest that the impacts on women transitioning to training seem to be driven by negative shocks to both female and male employment.

EMPIRICAL METHODOLOGY

I use the increasing import competition from China on US local labor markets as an exogenous source of variation in the employability and income, and the subsequent human capital investment decisions of an individual. This is inspired by the Autor, Dorn, and Hanson identification strategy where local labor markets (CZs) are treated as subeconomies that receive differential foreign trade shocks based on the initial patterns of regional industry specialization.[14] In the last few decades, the volume of imports into the United States had increased rapidly and US CZs received differential exposure from such imports because of the variation in the local manufacturing employment base.[15] Commuting zones are clusters of counties that create geographic units that are bound by the interlinking of buyers and sellers of labor and not necessarily by state lines.

14. Autor, Dorn, and Hanson, "The China Syndrome."
15. Autor, Dorn, and Hanson, "The China Syndrome."

However, distinct from the decadal measure of local labor market shocks provided in Autor, Dorn, and Hanson,[16] I create a measure of the magnitude of *yearly* trade shocks per capita to a US commuting zone c, relative to the employment in the region given as IPW_{ct}.

The estimating equation is as follows:

$$Y_{ict} = \beta_0 + \beta_1 IPW_{c(t-1)} + \beta_2 X_{ct} + \theta_c + \lambda_t + \varepsilon_{ict}.$$

Here, i denotes an individual, c represents a CZ, and t represents a year ranging from 2001 to 2014. Y is the main transition to training indicator outcome variable, X is a vector of demographics, θ constitutes the CZ fixed effects, and λ are time fixed effects. β_1 is the coefficient of interest. Standard errors are clustered at the CZ-year level.

The covariate of interest IPW_{ct} signifies a (yearly) measure of Chinese import penetration in commuting zone c, at time t. The main regressor is a per-capita measure of the change in import exposure in the commuting zone c:

$$IPW_{ct}^{USA} = \sum_j \frac{L_{cj}^{base}}{L_c^{base}} \cdot \frac{M_{jt}^{USA}}{L_j^{base}},$$

where L_{cj}^{base}/L_c^{base} stands for the share of commuting zone c's labor force that is employed in industry j in the base year,[17] and M_{jt}^{USA}/L_j^{base} stands for the per-capita level of Chinese imports to the United States in the corresponding industry j in year t. I use the lagged values of the import shock, both the one period lag (t-l) and the two-period lag (t-2) as the main explanatory variables since these decisions in year t are likely to be a function of local conditions in the recent past.

It is a reasonable concern that US imports from China could be correlated with industry import demand shocks from within the United States. If so, the ordinary least squares estimates could be biased and would understate the true impact of increased imports from China, since both the employment within the United States and Chinese imports might be correlated with some unobservable shocks to product demand in the United States. In order to identify the causal impact of increasing Chinese import exposure on manufacturing employment in the United States, it is important to account for this potential endogeneity of US trade exposure.

16. Autor, Dorn, and Hanson, "The China Syndrome."
17. I use the start-of-period (1990) employment as a base.

Thus, following the methodology provided in Autor, Dorn, and Hanson et al.,[18] I instrument for the growth in Chinese imports to the United States by using the contemporaneous growth of Chinese imports in other high-income developed countries.[19] In essence, I capture a supply shock from China and not a demand shock from the United States.[20] The instrument is given as follows:

$$IPW_{ct}^{HIC} = \sum_j \frac{L_{cj}^{lagged}}{L_c^{lagged}} \cdot \frac{M_{jt}^{HIC}}{L_j^{lagged}}.$$

Now, in order to further explore the heterogeneity by gender, I also explore the variation in gender-specific levels of import penetration. I follow the methodology provided in Autor, Dorn, and Hanson[21] and construct yearly measures of gender-specific import shocks as follows:

$$IPW_{ct}^{male} = \sum_j \frac{(1 - f_{jt90})L_{cj}^{base}}{L_c^{base}} \cdot \frac{\Delta M_{jt}^{USA}}{L_j^{base}}$$

$$IPW_{ct}^{female} = \sum_j \frac{(f_{jt90})L_{cj}^{base}}{L_c^{base}} \cdot \frac{\Delta M_{jt}^{USA}}{L_j^{base}},$$

where *f* denotes the employment share of females in industry *j* in the base year 1990.

Thus, essentially following this technique I am able to see whether my results differ based on whether the shocks were to the male-centered industries versus the female-centered industries.

Once again, these measures given above are yearly measures and distinct from the decadal measures provided in the seminal papers. By creating these yearly measures, I am able to look at short-term transitions made by individuals residing in these regions.

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18. Autor, Dorn, and Hanson, "The China Syndrome."

19. This group of high-income countries (Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, and Switzerland) is chosen based on their similarities to the United States and also on the availability of historical import data at the detailed product level needed to identify industry specific shocks.

20. Demand shocks in these high-income countries could be partially correlated with demand shocks in the United States, and thus it is important to state that this instrument reduces the endogeneity bias but does not eliminate it completely. However, the results from the instrumental variable analysis will provide a lower bound for effects.

21. David H. Autor, David Dorn, and Gordon Hanson, "When Work Disappears: Manufacturing Decline and the Falling Marriage Market Value of Young Men," *American Economic Review: Insights* 1, no. 2 (2019).

DATA AND DESCRIPTIVE STATISTICS

Two primary sources of data are used in this paper. The trade data come from the United Nations (UN) Comtrade Database. Data on US imports are available at the six-digit Harmonized System (HS) product level, mapped to comparable industry codes following the mapping methodology provided in Dorn.[22] Using the UN Comtrade database, I construct a per-capita trade exposure variable at the local labor market level, following the methodology provided in Autor, Dorn, and Hanson.[23] However, instead of a decadal shock à la Autor, Dorn, and Hanson, I construct yearly shocks from 2001 to 2014. Similarly, using the data on imports from China to other high-income countries, I also construct yearly instruments similar to the decadal instrument by Autor, Dorn, and Hanson.[24] To avoid any contamination due to potential mobility of population across areas, the trade data are collapsed at the level of CZs (a measure of the local labor market).

The data on individuals and their human capital decisions and other variable come from the March Annual Social and Economic Supplement (ASEC) rounds of Current Population Surveys (CPS) spanning 2001–2014. The CPS follows a four-eight-four–month rotating panel structure for each household entering the survey each month of the year. Respondents entering the March ASEC round are reinterviewed in two rotations of four and eight months, and thus, by linking such individuals, we are able to form a biennial panel from year t to year $t+1$. However, the CPS is a household-level panel survey and it tracks each household and not each individual in these households. Therefore, the individual members may migrate in and out of the household, which could be problematic. To account for this problem, I start with a sample of individuals in March of year t, the first month of their enrollment in the CPS. I then track these individuals to year $t+1$ and further restrict the sample to only those individuals who have lived in the household for at least a year (i.e., in year t).

The CPS since 2001 has collected responses to a range of questions related to "new welfare reform." Specifically, this relates to the Welfare Reform Law that took effect from 1997.[25] The CPS asked a series of questions that began by asking the respondent whether they attended training to learn a specific job skill such as car repairing, nursing, child minding/childcare, computer skills, and so forth.

22. David Dorn, "Essays on Inequality, Spatial Interaction, and the Demand for Skills." Dissertation, University of St. Gallen, no. 3613, September 2009.
23. Autor, Dorn, and Hanson, "The China Syndrome."
24. Autor, Dorn, and Hanson, "The China Syndrome."
25. This law also created the Temporary Assistance for Needy Families program, which was a replacement for the earlier Aid to Families with Dependent Children and Job Opportunities and Basic Skills Training programs.

In addition to the questions on individuals acquiring basic job training, questions were also asked whether individuals received job readiness training such as help with writing their CVs/résumés, interviewing skills, assistance with job search programs, help with filling out job applications, and also whether they participated in work experience programs such as community service jobs, or received training to improve basic math and reading skills. For the purpose of this analysis, I consider any such variables as pertaining to my job training transition outcome variable.

The main outcome variables of interest are whether or not the individual undertook training in any form as described above. For example, the training status of an individual is recorded in both years t and year $t+1$. Any changes in the training (i.e., receiving no training in year t while receiving training in year $t+1$) constitutes an indicator of training transition. Additional data from the CPS, along with data from the Bureau of Labor Statistics, are used for demographic and regional controls.

Finally, the level of analysis is an individual aged anywhere between 18 and 60 years of age, and the primary explanatory variation (the trade shock) is at the CZ level. Standard errors are clustered at the CZ level.

Table 1 shows the basic descriptive statistics related to the sample used in the main analysis on transition to job training. The mean age of my sample is approximately 40 years and about 56% of the individuals are married. Forty-eight percent of the respondents are men and about 12% are Black. Approximately 41% of the sample only has a high school degree or equivalent with no higher educational degree, and a small proportion (2%) live in public housing. Around 30% of my sample belongs to a household where at least one parent was an immigrant to the United States.

TABLE 1. DESCRIPTIVE STATISTICS

Variable	Mean (SD)
Age	40.11 (11.56)
Married	0.56 (0.49)
Male	0.48 (0.49)
Black	0.12 (0.33)
High school degree only	0.41 (0.49)
Living in public housing	0.02 (0.13)
One or both parents foreign-born	0.29 (0.45)

SOURCE: Based on author's own calculations using data from the March Annual Social and Economic Supplement (ASEC) rounds of Current Population Surveys (CPS) from 2001 to 2014.

RESULTS

Labor Market Effects of the Yearly Trade Exposure at the Commuting Zone Level

Since my main explanatory variable is a yearly measure of the trade shocks accruing to the local labor market and not the decadal measure created by Autor, Dorn, and Hanson,[26] I first investigate the labor market effects of such exposure at the CZ level. Specifically, I look at the impact on the average unemployment, the average income from wages and salaries, and the average household income for respondents residing in areas facing increasing import exposure. To create the CZ-level average labor market outcomes, I remove from my sample anyone in the armed forces or anyone not in the labor force. The explanatory variable is the standardized measure of the import penetration measure at the CZ level.[27]

Table 2 shows the results on average CZ-level unemployment using this measure without any lags and then both with a one-period and a two-period lag. Tables 3 and 4 show the corresponding results on the CZ-level average wage income and the CZ-level average household income, respectively. In all of these analyses, I also control for important CZ-level racial and demographic variables.

Results from tables 2–4 suggest that unemployment increased and the average income from wages and salaries and also household income decreased

TABLE 2. UNEMPLOYMENT AND YEARLY CHANGE IN IMPORT PENETRATION (INSTRUMENTAL VARIABLES REGRESSION)

Impact on CZ-level unemployment	(1) Import penetration (no lags)	(2) Import penetration (one-period lag)	(3) Import penetration (two-period lag)
Import penetration	0.0191*** (0.0070)	0.0204** (0.0086)	0.0259*** (0.0072)
Observations (CZ-Year)	2,147	2,147	2,147
Year FE	YES	YES	YES
CZone FE	YES	YES	YES
CZ-level controls added	YES	YES	YES
F-stat	*25.862*	*30.814*	*39.748*

NOTE: Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
SOURCE: This table uses trade data from United Nations (UN) Comtrade Database to create the explanatory variables and the March ASEC rounds of CPS from 2001 to 2014 to create the dependent variable. Additional CZ-level control variables are created using data from the CPS and the Bureau of Labor Statistics.

26. Autor, Dorn, and Hanson, "The China Syndrome."
27. Here, I show the results for the overall local labor market shock measure. The corresponding results for the labor market impacts of the gender-specific shocks are provided in the appendix tables A.1–A.3.

TABLE 3. AVERAGE INCOME AND YEARLY CHANGE IN IMPORT PENETRATION (INSTRUMENTAL VARIABLES REGRESSION)

Impact on CZ-level income from wages and salaries	(1) Import penetration (no lags)	(2) Import penetration (one-period lag)	(3) Import penetration (two-period lag)
Import penetration	–0.0806* (0.0436)	–0.0972*** (0.0364)	–0.0990*** (0.0288)
Observations	2,147	2,147	2,147
Year FE	YES	YES	YES
CZone FE	YES	YES	YES
CZ-level controls added	YES	YES	YES
F-stat	*25.862*	*30.814*	*39.748*

NOTE: Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
SOURCE: This table uses trade data from United Nations (UN) Comtrade Database to create the explanatory variables and the March ASEC rounds of CPS from 2001 to 2014 to create the dependent variable. Additional CZ-level control variables are created using data from the CPS and the Bureau of Labor Statistics.

TABLE 4. AVERAGE HOUSEHOLD INCOME AND YEARLY CHANGE IN IMPORT PENETRATION (INSTRUMENTAL VARIABLES REGRESSION)

Impact on CZ-level household income	(1) Import penetration (no lags)	(2) Import penetration (one-period lag)	(3) Import penetration (two-period lag)
Import penetration	–0.0882*** (0.0315)	–0.0994*** (0.0265)	–0.0955*** (0.0270)
Observations (CZ-Year)	2,147	2,147	2,147
Year FE	YES	YES	YES
CZone FE	YES	YES	YES
CZ-level controls added	YES	YES	YES
F-stat	*25.862*	*30.814*	*39.748*

NOTE: Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
SOURCE: This table uses trade data from United Nations (UN) Comtrade Database to create the explanatory variables and the March ASEC rounds of CPS from 2001 to 2014 to create the dependent variable. Additional CZ-level control variables are created using data from the CPS and the Bureau of Labor Statistics.

as a result of increased exposure to import competition in the CZs. The negative effects are also stronger for the one- and two-period lagged values of the import penetration measure, and thus for the next set of results pertaining to the transition to training, I use the one-period and two-period lags.

Transition to Training and the Yearly Trade Exposure at the Commuting Zone Level

Table 5 presents the main results on the transition to training. Once again, the explanatory variable is the standardized measure of the (overall) import penetra-

TABLE 5. TRAINING TRANSITION AND YEARLY CHANGE IN IMPORT PENETRATION (INSTRUMENTAL VARIABLES REGRESSION)

Impact on transition to training	(1) Overall	(2) Male	(3) Female
Import penetration	0.00355	–0.00222	0.00869**
(one-period lag)	(0.0025)	(0.0019)	(0.0042)
F-stat	*81.146*	*81.939*	*79.445*
Import penetration	0.00363*	–0.000987	0.00753**
(two-period lag)	(0.0022)	(0.0017)	(0.0034)
F-stat	*105.334*	*102.324*	*105.965*
Observations	161,242	77,026	84,216
Year FE	YES	YES	YES
CZ FE	YES	YES	YES
Clustering	CZ-Year	CZ-Year	CZ-Year

NOTE: Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
SOURCE: This table uses trade data from United Nations (UN) Comtrade Database to create the explanatory variables and the March ASEC rounds of CPS from 2001 to 2014 to create the dependent variable. Additional CZ-level control variables are created using data from the CPS and the Bureau of Labor Statistics.

tion measure at the CZ level, showing this measure both with a one-period and a two-period lag.

Results from table 5 suggest that using the two-period lagged measure, one standard deviation increase in the import penetration in US CZs leads to an almost 0.4 percentage point increase in the transition to worker training overall. I do not find any statistically significant impact on men. For women specifically, one standard deviation increase in the import penetration in US CZs leads to an almost 0.8 percentage point increase in the transition to worker training and an almost 0.9 percentage point increase in the transition to worker training when considering the one-period lag of the CZ import shock.

Next, I consider negative shocks to male-dominant industries relative to female-dominant industries (based on the gender share of employment in the base period in such regions). Table 6 shows the results of the impact of negative shocks to male-dominant industries, and table 7 shows the corresponding impact of negative shocks to female-dominant industries. From table 6, I find no impact on training transitions from negative shocks to male industries on the overall sample and also on males transitioning to training. However, negative shocks to male-dominant industries do lead to a positive and statistically significant impact on females transitioning to job training.

However, table 7 suggests that shocks to female-dominant industries do lead to a positive and significant impact on job training for the overall sample and also for women in particular. In summary, almost all the results seem to be driven by the females residing in these regions impacted by import penetration.

TABLE 6. YEARLY CHANGE IN IMPORT PENETRATION: SHOCKS TO MALE-DOMINANT INDUSTRIES

Impact on	(1) Overall	(2) Males	(3) Females
Import penetration (one-period lag)	0.00330 (0.0024)	–0.00230 (0.0018)	0.00824** (0.0040)
Import penetration (two-period lag)	0.00323 (0.0020)	–0.00106 (0.0016)	0.00682** (0.0031)
Observations	161,242	77,026	84,216
Year FE	YES	YES	YES
CZ FE	YES	YES	YES

NOTE: Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
SOURCE: This table uses trade data from United Nations (UN) Comtrade Database to create the explanatory variables and the March ASEC rounds of CPS from 2001 to 2014 to create the dependent variable. Additional CZ-level control variables are created using data from the CPS and the Bureau of Labor Statistics.

TABLE 7. YEARLY CHANGE IN IMPORT PENETRATION: SHOCKS TO FEMALE-DOMINANT INDUSTRIES

Impact on	(1) Overall	(2) Males	(3) Females
Import penetration (one-period lag)	0.00390 (0.0026)	–0.00135 (0.0021)	0.00871** (0.0042)
Import penetration (two-period lag)	0.00439* (0.0025)	–0.000309 (0.0020)	0.00849** (0.0038)
Observations	161,242	77,026	84,216
Year FE	YES	YES	YES
CZ FE	YES	YES	YES

NOTE: Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
SOURCE: This table uses trade data from United Nations (UN) Comtrade Database to create the explanatory variables and the March ASEC rounds of CPS from 2001 to 2014 to create the dependent variable. Additional CZ-level control variables are created using data from the CPS and the Bureau of Labor Statistics.

CONCLUSION

This paper investigates the impact of negative labor market shocks brought about by import penetration on acquiring job training and focuses on transitions made by individuals residing in regions subjected to such import penetration shocks. This question is important, especially in the context of economic mobility and policy, because it is worth investigating whether individuals who have faced long-term and persistent economic shocks continue to remain in cycles of poverty, or if they make decisions that might help to break such cycles. I create a yearly measure of the per-capita import competition accruing to local labor markets in the United States, inspired by the decadal shocks given in Autor, Dorn,

and Hanson.[28] I also show that these yearly shocks led to a negative effect on the labor market outcomes of individuals residing in these local labor markets. Results suggest that individuals residing in US CZs do make transitions to job skill and job readiness trainings. Overall, one standard deviation increase in the import penetration measure in the local labor market leads to an almost 0.4 percentage point increase in the transition to worker training. The results seem to be largely driven by females for whom one standard deviation increase in the import penetration measure in the local labor market leads to an almost 0.8 percentage point increase in the transition to worker training. Further heterogeneity analyses by the variation in gender-specific levels of import penetration shocks suggest that the impacts on women transitioning to training seem to be driven by negative shocks to both female and male employment. The analysis finds no such positive impacts for males.

28. Autor, Dorn, and Hanson, "The China Syndrome."

APPENDIX

TABLE A.1. UNEMPLOYMENT AND YEARLY CHANGE IN IMPORT PENETRATION (INSTRUMENTAL VARIABLES REGRESSION)

Impact on CZ-level unemployment	(1) Import penetration (no lags)	(2) Import penetration (one-period lag)	(3) Import penetration (two-period lag)
Import penetration (male)	0.0145** (0.0057)	0.0156** (0.0068)	0.0210*** (0.0056)
Import penetration (female)	0.0260** (0.0103)	0.0300** (0.0128)	0.0333*** (0.0095)
Observations (CZ-Year)	2,147	2,147	2,147
Year FE	YES	YES	YES
CZone FE	YES	YES	YES
CZ-level controls added	YES	YES	YES

NOTE: Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

TABLE A.2. AVERAGE INCOME AND YEARLY CHANGE IN IMPORT PENETRATION (INSTRUMENTAL VARIABLES REGRESSION)

Impact on CZ-level income from wages and salaries	(1) Import penetration (no lags)	(2) Import penetration (one-period lag)	(3) Import penetration (two-period lag)
Import penetration (male)	–0.0671* (0.0355)	–0.0854*** (0.0307)	–0.0855*** (0.0248)
Import penetration (female)	–0.0712 (0.0566)	–0.0851* (0.0441)	–0.0971*** (0.0355)
Observations	2,147	2,147	2,147
Year FE	YES	YES	YES
CZone FE	YES	YES	YES
CZ-level controls added	YES	YES	YES

NOTE: Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

TABLE A.3. AVERAGE HOUSEHOLD INCOME AND YEARLY CHANGE IN IMPORT PENETRATION (INSTRUMENTAL VARIABLES REGRESSION)

Impact on CZ-level household income	(1) Import penetration (no lags)	(2) Import penetration (one-period lag)	(3) Import penetration (two-period lag)
Import penetration (male)	–0.0677*** (0.0253)	–0.0786*** (0.0213)	–0.0768*** (0.0217)
Import penetration (female)	–0.106*** (0.0410)	–0.125*** (0.0369)	–0.115*** (0.0346)
Observations (CZ-Year)	2,147	2,147	2,147
Year FE	YES	YES	YES
CZone FE	YES	YES	YES
CZ-level controls added	YES	YES	YES

NOTE: Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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