7-8-2024

# Enter Stage Left: Immigration and the American Arts

K. Pun Winichakul
*Smith College*, kwinichakul@smith.edu

Ning Zhang
*The Chinese University of Hong Kong*

# Enter Stage Left: Immigration and the American Arts

K. Pun Winichakul[a] and Ning Zhang[b]

[a]Department of Economics, Smith College, Northampton, MA 01063, United States, kwinichakul@smith.edu

[b]Department of Economics, The Chinese University of Hong Kong, Sha Tin, New Territories, Hong Kong, ning.zhang@cuhk.edu.hk

[b]Corresponding Author

July 8, 2024

**Abstract**

To what extent have immigrants contributed to the growth of the United States arts sector? In this paper, we explore the impact of immigration during the Age of Mass Migration on the development of the arts in the U.S. over the short and long run. In the short run, our results suggest that immigration helped produce greater numbers of native artists. Over a century later, the benefits to the arts persist. Counties with greater historical immigration house more arts businesses and nonprofit organizations that generate more revenue, employ a larger proportion of the community, and earn more federal arts grants. We explore potential mechanisms, including factors such as increased exposure to new cultures and arts knowledge between immigrants and natives. Altogether, our results highlight the important role that immigrants played in the development of the arts in America.

**Keywords: Immigration, Arts, Economic Development**

JEL Classification: Z11, F22, O35

# 1 Introduction

Immigration fundamentally reshapes American communities, as people are exposed to new cultures and practices. Many stories have been written about how fields such as music, dance, and the visual arts, for instance, have both integrated and benefited from immigrant ideas historically (e.g., Scheffler, 2009; Smith et al., 2011; Pareles, 2019; Hirschman, 2013). Today, individuals continue to credit the role of immigrants in their creative projects. In some cases, immigrants artists make direct contributions to arts projects.[1] In others, immigrants provide the primary inspiration, ideas, or themes that are represented in works of art (Feinberg, 2019). The stories of immigrant influence on creative endeavors suggest that they may have played an important role in the development, and the continued prosperity, of the American arts industry.

In this paper, we systematically analyze the impact of immigration on the growth of the broad arts sector in the United States. By exploring the impact of both artist and non-artist immigration, we provide evidence that complements the findings of innovative work such as Borowiecki and Graddy (2021) about the influence of immigrant artists on native artists. In other complementary work, scholars have studied the economic consequences of diversity in American cities (Ottaviano and Peri, 2006; Mazzolari and Neumark, 2012).[2] We focus on the impact of immigration on the American arts industry in aggregate, measuring short- and long-run outcomes that capture progress both in more immediate and in more extensive terms. Our comprehensive approach leads us to evaluate a series of explanations that shed light on the key factors behind the sustained development of the arts.

To explore our research question, we use data from the Age of Mass Migration (AMM, 1850-1914), one of the largest periods of migration in U.S. history and one where the distribution of regions where migrants originated shifted substantially. We first examine short-run arts outcomes for counties that experience different levels of immigration during the prior decade. To address potential identification concerns with using ordinary least squares (OLS) estimates, we adopt the instrumental variables approach introduced by Sequeira et al. (2020). The authors leverage the gradual expansion of the railway network and differences in national immigration inflows by decade, to instrument for county-level immigration. We then explore long-run arts outcomes by comparing counties with different historical immigration during the AMM. We use the same instrument to analyze these long-run effects. More precisely, variation for the instrument in our long-run analysis comes both from whether national level immigration was either high or low at the the

[1] For example, Kumail Nanjiani, executive producer of the anthology series *Little America* reflected on his recruitment of writers who shared the experiences of the stories told on the show: "...[W]e ended up having a lot of writers who it was their first job writing for TV. There are tremendously talented people from all parts of the world who haven't gotten a chance to build a resume yet" (Yu, 2020).

[2] Outside of the arts, researchers have highlighted the role that immigration has played in scientific innovation (Hunt and Gauthier-Loiselle, 2010; Moser et al., 2014). We build upon this literature by highlighting the effect of broad immigration on the American arts, where the creative process may require distinct methods from those used in the sciences (Furnham et al., 2011; Botella and Lubart, 2016).

time of connection to the rail network *as well as* immigration levels in all subsequent connected decades.

In the short run, we find that greater immigration into a county during the prior decade increases the share of natives employed in arts occupations in the county in the following decade. Our short-run results, which include both immigrant artist and non-artist inflows, complement the work of Borowiecki and Graddy (2021) who find that larger immigrant artist inflows lead to native-born artist growth decade-over-decade.[3] We also evaluate the long-term impact of immigration on arts communities roughly a century after the Age of Mass Migration. We note that counties that experienced greater inflows of migrants during the AMM have greater arts presences today. These counties house a larger number of arts businesses and arts nonprofits that employ a larger fraction of their populations. Beyond employment, these arts institutions report larger revenues and have been awarded a larger number of National Endowment for the Arts grants with greater average award value.

Our long study period and broad evaluation of the arts sector allows us to explore multiple mechanisms through which immigration contributed to American arts industry's growth. Beginning with the short run, a natural channel to consider is the transfer of specialized arts knowledge from immigrant artists to natives. We find evidence to support this mechanism; however, our results also suggest that immigrants *without* arts backgrounds also contribute to the growth of natives' arts employment. We also find that immigration does not attract native artists from other areas of the U.S., but shifts local natives into arts occupations. Finally, we observe that the increase in natives employed in the arts is driven by individuals who were not themselves children of immigrants. These results suggest that to thoroughly understand the factors behind the growth of the American arts in both the short- and long-term, it is valuable to review mechanisms beyond the influence of immigrant artists or within-family skills transfers.

One channel we consider is that immigrants both with and without arts backgrounds shared aspects of their culture and practices, including their tastes in the arts, with natives. This diffusion of culture through more frequent interactions between immigrants and natives may have been novel during the AMM, given the distributional shift in sending countries from which immigrants arrived. In line with this mechanism, we find in the short run that counties that experienced greater immigrant inflows from particular European nations (e.g., France) exhibited increases in the number of natives practicing art forms of prominence in those countries of origin (e.g., sculpture). Beyond the arts, horizontal cultural transmission has also been argued as a mechanism that shaped preferences for redistribution and political ideology (Giuliano and Tabellini, 2021).

The early exchange of arts experiences between immigrants and natives could have seeded the creation

[3]We can also replicate the results of Borowiecki and Graddy (2021) by focusing on the impact of immigrant artists inflows, both when using a broader definition of artists and when following the occupations used in their paper.

of sustainable arts markets in the long run. In addition to this direct channel, the arts could have also developed indirectly over time through improved local economic productivity, as shown by Sequeira et al. (2020). General economic growth could allow certain areas to construct infrastructure necessary to sustain the arts. We offer suggestive evidence of the role of both direct and indirect channels using causal mediation analysis (Dippel et al., 2020a,b). We find meaningful effects supporting both channels. That is, we find significant indirect effects which signal that long-run economic growth in counties resulting from AMM immigration was a factor in the development of the arts. The analysis also suggests that direct effects affected the long-run growth of the American arts, which we take to include factors such as the diffusion of arts preferences, or reaching a critical threshold of artistic knowledge during this period of significant immigration in the U.S.

Overall, our findings regarding the role of immigration in the development of the American arts add to an important and growing body of work that explores diversity and the arts as a mechanism for economic development (Ottaviano and Peri, 2006; Falck et al., 2011).[4] Development of the arts is also valuable for non-economic reasons – existing scholarship has documented educational, mental health, and physical health benefits from the arts (e.g., Erickson et al., 2022; Hanshumaker, 1980; Secker et al., 2011).[5] Other related work examines the short- and long-term impact of immigrants who arrived in the United States during the Age of Mass Migration. These papers have documented immigrant contributions to economic and political development, as well as backlash immigrants received from natives during this time period (Abramitzky and Boustan, 2017; Sequeira et al., 2020; Tabellini, 2020; Giuliano and Tabellini, 2021).[6] Related literature has also documented the outsized share of immigrants involved in entrepreneurial activities (Kerr and Kerr, 2018; Azoulay et al., 2020). Finally, beyond economic development, our paper complements research exploring the transfer of subject-specific skills between immigrants and natives. Much of this work has been concentrated in scientific fields, with recent research exploring artistic fields (e.g., Moser et al., 2014; Borowiecki and Graddy, 2021).[7] In short, our work intersects with each of these research areas by highlighting the enrichment provided

[4]Ottaviano and Peri (2006), for example, document the labor and housing market effects of cultural diversity in U.S. metropolitan areas.

[5]Erickson et al. (2022) find that arts field trips produce benefits for students' academic and social-emotional outcomes. Hanshumaker (1980) reviews a collection of studies describing the impact of arts education on child skill development; Secker et al. (2011) similarly conducts a program evaluation for an UK arts education program. Beyond the academic literature, children's hospitals across the United States utilize arts therapy programs as part of their treatment for kids in their care. Our paper focuses on the development of the arts in the U.S., which in turn has yielded arts education opportunities like those described in these papers.

[6]Other work has studied the benefits of immigration to economic growth outside of the Age of Mass Migration (Kerr and Lincoln, 2010; Khanna and Lee, 2018).

[7]This literature, for example, has documented growth in US chemistry patents as a result of Jewish emigres, greater numbers of patents in fields with more immigrant college graduates, links between the share of immigrants in an industry and patents, and associations between immigration and local firm innovation (Moser et al., 2014; Hunt and Gauthier-Loiselle, 2010; Borjas and Doran, 2012; Akcigit et al., 2017; Burchardi et al., 2020). Moreover, related research has shown that historical immigration restrictions such as the U.S. immigration quota acts during the 1920s decreased innovation and inventions (Moser and San, 2020; Doran and Yoon, 2020). Borowiecki and Graddy (2021) study within-arts skills transfers, providing decade-by-decade links between the presence of immigrant artists and native artists in American cities.

by immigrants who arrived during the AMM to the arts sector.

Our interest in the role of historical immigration on arts development in the United States naturally complements two recent papers. First, our paper complements the work of Sequeira et al. (2020). We mirror their empirical strategy but study a different question; namely, the impact of immigration on the growth of the arts in America. In doing so, we review potential mechanisms through which the American arts may have developed, including the long-run economic benefits of immigration identified in their paper. Second, our study builds upon the research of Borowiecki and Graddy (2021). To supplement their identification of the important knowledge spillovers from immigrant artists to natives, we focus on the long-run growth of the American arts industry resulting from broader immigrant inflows.[8] That is, by adopting a different empirical strategy that uses population movements during the Age of Mass Migration, one of the most notable periods of immigration in American history, we can highlight the role of the broader immigrant community on long-run American arts development, while also reiterating the role of immigrant artists as one key mechanisms underlying this growth.[9]

The rest of the paper proceeds as follows. In Section 2, we provide background regarding the Age of Mass Migration and the arts in the United States. In Section 3 we describe the data we use. In Section 4, we outline our empirical strategy and report results in Section 5. In Section 6, we review potential mechanisms behind our results. Finally, in Section 7 we conclude.

# 2 Background

## 2.1 The Age of Mass Migration

Nearly 30 million Europeans arrived in the United States during the Age of Mass Migration. In prior waves of European immigration, the majority of individuals arrived from the western part of the continent. Individuals who crossed the Atlantic during this time period were instead largely from southern and eastern Europe (Abramitzky and Boustan, 2017). The unique set of sending countries was reflected in the diversity of languages spoken and religious customs followed (Sequeira et al., 2020; Hatton and Williamson, 2005; Daniels, 2002).

Immigrants from southern and eastern Europe also held a wide range of occupations. They worked in a mix of (traditionally-defined) less-skilled and skilled work. Immigrants from certain sending countries

[8] We include immigrants who do not report primary work in the arts occupations. In doing so, we test the potential for arts production and creativity to differ from fields such as the sciences, where formal training and methodologies may be more central (Furnham et al., 2011).

[9] Other social science research has documented the settlement patterns of prominent visual artists, composers, and authors, noting that many appeared in the U.S. during the 19th century (overlapping with the first part of the Age of Mass Migration), while others arrived in subsequent periods (e.g., World War II) (Kelly and O'Hagan, 2007; O'Hagan and Hellmanzik, 2008; O'Hagan and Borowiecki, 2010; Kuld et al., 2021).

were disproportionately employed in areas such as carpentry, cabinet-making, and clock-making, among others (Abramitzky et al., 2014). Immigrants also pursued work in the arts, and many Americans credit immigrant artists as influences on their own work (Glueck, 2004). Some scholars suggest that immigrants were able to contribute significantly due to their socialization in multiple cultures and languages. They argue these experiences were just as important to their artistic successes as any inherent individual artistic talents (Hirschman, 2013).

Beyond artists, natives had more regular opportunities to interact with new cultures among the broader immigrant population that could have sparked their own creativity. Immigrants brought influences from their countries of origins to America, introducing new styles and genres across music, dance, and the visual arts. As the AMM led to more frequent interactions in many aspects of everyday life, immigrants with both arts and non-arts backgrounds may have had significant influences on native work. Figure 1 plots immigration inflows to the United States during the Age of Mass Migration. It also plots changes in the number of native artists as a share of the U.S. population during this time. Figure 1 illustrates that changes in the number of native artists are correlated with immigration inflows. This association suggests immigration could have affected native occupational choices through the diffusion of arts and cultural practices previously unfamiliar to the native population at that time.

## 2.2 American art history before and during the Age of Mass Migration

Many early American colonial paintings reflected the social and political struggle of the nation. In the nation's infancy, paintings often documented major events and figures of the Revolutionary War. Beyond paintings, colonial Americans filled their homes with fine arts such as woodcraft and pottery to signal social status and refined cultural taste (Miller et al., 2008). Outside of European Americans, American indigenous art often captured the natural and spiritual characteristics of their societies. As families of American colonists expanded westward, their art also began to include images of natural lands. At the same time, their art reflected the conflict and violence toward indigenous communities. Eastern Americans documented their contentious encounters with American indigenous peoples, whose communities were being upended by colonists coming from the east (Miller et al., 2008). However even as artistic diversity began to grow by the mid-19th century, the total number of individuals who reported arts-related jobs as their primary occupation remained limited (Borowiecki, 2019).

In the latter part of the 19th century, American art incorporated styles of innovative artists from abroad. A select number of American artists with financial means traveled to Europe to formally study under European artists. Others did not receive formal training but instead immersed themselves in the cultures across

the Atlantic (Cotter, 2012). Experiences from traveling abroad shaped their own work when they returned to the United States. In addition to the few Americans who traveled abroad, many Europeans, particularly those from southern and eastern Europe, began arriving on American shores at this time. Immigrants who arrived during the AMM also brought their artistic tastes. American art began to incorporate immigrant influences, and immigrants helped define what constituted American culture and art styles during this period. Their influence was reflected across many modes of art, including music, dance, and cinema (Hirschman, 2013).

# 3 Data

We take advantage of multiple data sources for our analysis. In particular, we use U.S. Census data from IPUMS USA and NHGIS (Ruggles et al., 2020), digitized railway network data from Sequeira et al. (2020), and aggregate U.S. immigration inflow data from Willcox (1929). We also use data from County Business Patterns (CBP) regarding arts businesses in 2000, 2005, 2010, 2015, and 2020, and the Urban Institute's National Center for Charitable Statistics regarding arts nonprofit organizations from 1987-2018 (National Center for Charitable Statistics, 2020). Finally, we compile data on National Endowment for the Arts (NEA) grants disbursed between 1998 and 2020 (National Endowment for the Arts, 2021). For our long-term outcomes, data set years are not kept constant across sources in order to use the maximum amount of data available to us.

First, we use U.S. Census micro-data from 1860 to 1920 through IPUMS USA. In the data, we examine the presence of artists across the U.S. during this time period. We define artists as individuals who work primarily in an arts-related occupation. The National Endowment for the Arts, for example, includes artist communities, arts education, dance, design, folk & traditional arts, literary arts, local arts agencies, media arts, museums, music, musical theater, opera, presenting & multidisciplinary works, theater, and visual arts, as areas of the arts funded by their grants.[10] To mirror these categories, examples of arts-related occupations included in our analysis are actors, artists, sculptors, teachers of art, authors, designers, musicians, teachers of music, architects, and photographers.[11] Beyond occupation information, we use Census data drawn from NHGIS to obtain the share of immigrants in a county, based on nativity.

Second, we use historical data on county connections to the railway network from Sequeira et al. (2020). The authors constructed each county's access to rail transit using historical maps that outlined both national

[10] See, e.g, https://www.arts.gov/grants/grants-for-arts-projects/artistic-disciplines

[11] A formal list of occupations included in our definition is provided in Appendix Table A.1. In Table A.2, we show our short-run analysis is robust to defining artists following the occupations used in Borowiecki and Graddy (2021). In additional robustness checks, we try alternative definitions of artists, such as dropping architects, designers, draftsmen, and apprentices of these occupations from our analysis. The main results are not affected. The results of these analyses are not reported in the paper, but are available upon request.

and regional coverage. Sequeira et al. (2020) obtained a geo-referenced shapefile of the current railway network from the United States Department of Transportation. They overlayed the shapefile onto a digitized map to precisely identify the railway lines in each decade between 1830 and 1920. We take advantage of the data they provide to document each county's connection to the railway. We consider a county to have access to the railway if its boundary is intersected by at least one rail line.

Third, we measure national immigration inflows into the U.S. using data from Willcox (1929). Inflow estimates are calculated from passenger lists provided by the masters of arriving vessels. We use the lists to calculate the total number of immigrants from Europe who arrived each year between 1860 and 1920, as well as to identify total immigrants from specific sending regions. Immigrants were defined as foreign passengers who arrived with the intention of settling down.

Fourth, we collect information from County Business Patterns (2000, 2005, 2010, 2015, and 2020) to study the potential impact of historical immigration on the formation of arts businesses in contemporary times. The CBP data are accessible through the U.S. Census Bureau and include information on businesses and employees at the county level. We apply the 4-digit NAICS code to identify arts businesses. The industry code that denotes arts-related firms (NAICS code 7111-7121) includes organizations related to the performing and visual arts, such as theater, dance, musical groups, and museums, as well as independent artists, writers, and performers, among others (see Appendix Table A.3 for a full list).

Fifth, we explore arts nonprofit financial information from the Urban Institute's National Center for Charitable Statistics (NCCS) between 1987 and 2018. The data complement the CBP business data by measuring the presence of arts nonprofits in the United States over the past few decades (National Center for Charitable Statistics, 2020). The NCCS data are compiled from Form-990 tax documents completed by all U.S. nonprofit institutions each year who receive revenue above a minimum reporting threshold. In the data, we identify arts nonprofits by codes that delineate each organization's primary cause/mission. The data also include information about organization annual revenues and expenditures.

Finally, we leverage comprehensive information on National Endowment for the Arts grant recipients from 1998 to 2020 (National Endowment for the Arts, 2021). The National Endowment for the Arts is a federal agency that is one of the largest arts grant-making institutions in the United States. Each year, it awards thousands of grants to provide Americans with diverse opportunities to participate in, and complete, arts projects and programs. NEA provides cost/share matching grants to nonprofit organizations for a wide range of arts projects, such as literature fellowships for writers and translators, and Partnership Agreements with 62 state/jurisdictional arts agencies and regional arts organizations. The grants database includes a comprehensive list of all individuals and organizations that have received an NEA grant since 1998. The database lists the award amount for each grant, the geographic location of the recipient, and the applicable

arts sub-field for the grant.[12]

# 4 Empirical Strategy

We analyze the impact of immigration during the Age of Mass Migration on the development of the arts both in the short and long term. Below, we elaborate on our identification strategy.

## 4.1 Short-term effects

In the baseline specification for identifying short-term effects, we use a panel of U.S. counties from 1860–1920 and estimate the following ordinary least squares equation:

$$\frac{Y_{ct}}{Pop_{ct}} = \beta_0 + \beta_1 \frac{I_{ct}}{Pop_{ct}} + \mathbf{X}_{ct}\Gamma + \mu_t + \mu_c + \mu_{st} + \epsilon_{ct}. \tag{1}$$

In the specification above, $Y_{ct}$ is the outcome of interest for county $c$ in decade $t$, such as the number of native artists. The term $Pop_{ct}$ is a county's population in decade $t$. Thus, the term $\frac{Y_{ct}}{Pop_{ct}}$ represents the share of the county population that are native artists in period $t$. The term $I_{ct}$ represents the number of immigrants, and the term $\frac{I_{ct}}{Pop_{ct}}$ stands for the share of the county population that are immigrants in decade $t$. The term $\mathbf{X}_{ct-1}$ is a vector of county characteristics, and $\mu_t$ and $\mu_c$ are a set of decade and county dummies, respectively.[13] We also include state-by-year fixed effect $\mu_{st}$. The coefficient of interest is $\beta_1$, which measures the effect of immigration on short-term county outcomes. We cluster standard errors at the county level.

However, estimating equation (1) could suffer from endogeneity bias. For instance, one possibility is that counties with favorable economic conditions could have offered greater opportunities in the arts, all while attracting a larger number of immigrants. This factor would bias the OLS estimate upward. On the other hand, counties with fewer economic opportunities (including those available in the arts) could have brought in greater numbers of immigrants, whether that be due to natives discriminating against non-native populations and pushing them toward less-desirable locales, or due to self-selection into areas with greater demand for low-skilled occupations and lower demand for occupations in and adjacent to the arts. These factors would bias the OLS estimate downward. Therefore, to address potential endogeneity bias, we employ an instrumental variables approach (2SLS) first adopted by Sequeira et al. (2020). In the short-term, we

[12] We are not aware of any local or state entities that have been restricted from receiving NEA federal grants during this time period.

[13] We elaborate in greater detail what county characteristics from the prior time period $t-1$ are included in this vector when discussing our main instrumental variables empirical strategy.

follow their empirical specifications, with the only adjustments being an application of their main empirical strategy to our short-term time frame. We describe the approach in more detail below.

#### 4.1.1 Instrument: Rail access and national immigration inflows

We adopt the instrument constructed by Sequeira et al. (2020), which interacts fluctuations in national immigrant inflows with the gradual expansion of the railway network in the United States. As discussed in Sequeira et al. (2020), this instrument uses two levels of variation related to immigration during the AMM. The first source of variation is from national immigration inflows across decades. The second source of variation is derived from arriving immigrants who used rail transit to travel inland to their final destinations (Faulkner, 1960; Foerster, 1969). The timing of a county's connection to the railway network, coupled with when the U.S. was experiencing large national inflows of immigrants, likely affected the number of individuals that settled in a county. The benefit of combining the timing of railway construction with the timing of national immigration booms is that the interaction between the two produces variation that is unlikely to affect our arts outcomes of interest other than through its influence on immigration to a county. It is worth reemphasizing that we are not comparing counties with railway access to counties without railway access, as these groups of counties are likely to be systematically different. Instead, we compare counties that connect to the railway during immigration booms to counties that connect to the railway during immigration busts. Below we note that these two groups of counties are similar along multiple dimensions.[14]

With this instrument, we estimate the first- and second-stages of the 2SLS analysis, described in equations (2) and (3) below. In short, these specifications are equivalent to equations (1) and (3) in Sequeira et al. (2020), or the "zero-stage" and second-stage equations in their paper.[15]

$$\frac{I_{ct}}{Pop_{ct}} = \alpha_1 \frac{\Delta I_{t-1}}{Pop_{t-1}} \times I^{RR}_{ct-1} + \alpha_2 I^{RR}_{ct-1} + \alpha_3 \frac{I_{ct-1}}{Pop_{ct-1}} + \mathbf{X}_{ct-1}\Pi + \mu_t + \mu_c + \mu_{st} + \nu_{ct} \tag{2}$$

$$\frac{Y_{ct}}{Pop_{ct}} = \beta_1 \frac{I_{ct}}{Pop_{ct}} + \beta_2 I^{RR}_{ct-1} + \beta_3 \frac{I_{ct-1}}{Pop_{ct-1}} + \mathbf{X}_{ct-1}\Gamma + \mu_t + \mu_c + \mu_{st} + \xi_{ct}. \tag{3}$$

The term $\frac{\Delta I_{t-1}}{Pop_{t-1}}$ represents national immigration inflows ($\Delta I_{t-1}$) between periods $t-1$ and $t$ as a share of the total U.S. population in period $t-1$ ($Pop_{t-1}$). The term $I^{RR}_{ct-1}$ is an indicator variable that equals one if county $c$ is connected to the railway in period $t-1$. The term $\frac{\Delta I_{t-1}}{Pop_{t-1}} \times I^{RR}_{ct-1}$ is the interaction between national immigration inflows as a share of the United States population, and whether a county is connected to the railway network in period $t-1$. The key interaction term captures the heterogeneous effect

[14] While the interaction is important to the construction of the instrument, moving forward we sometimes refer to this as the "railway instrument" for expositional ease.

[15] When we move to our long-term effects specifications, we include estimation of equation (2), so that our analyses involves each of the zero-, first-, and second-stages.

of access to a railway on immigrant settlement in a county during national-level immigration booms relative to national-level immigration lulls.

Our empirical strategy continues to mirror Sequeira et al. (2020) by including additional factors that may affect the size of the immigrant population in a county. We include the lagged immigrant share in a county, $\frac{I_{ct-1}}{Pop_{ct-1}}$, to control for the mechanical effect of the existing size of the immigrant population.[16] The vector of controls $X_{ct-1}$ includes the interactions $GDP_{t-1} \times I^{RR}_{c,t-1}$ and $Indus_{t-1} \times I^{RR}_{c,t-1}$ to account for potential associations between business cycle variations and industrial development, respectively. It also includes county characteristics such as a lagged indicator for county urbanization, lagged county population density, and the interaction between the lagged urbanization measure and lagged immigration inflows (at the national level) as a share of total population, each of which flexibly capture a series of factors that could affect immigrant share estimates. We continue to cluster standard errors at the county level. We also report Conley spatial standard errors that use a five-degree window for our main results (Conley, 1998, 2008).[17]

To check the validity of the instrument, we perform a balance test that compares the baseline characteristics of counties that differ by railway connection timing and national immigration inflows at that time. For example, we evaluate whether the foreign-share of the population before the AMM differed between counties connected during booms and busts. We can also explore whether population density or urbanization differed between these counties prior to our study period, among other county characteristics. We do not find significant differences in the baseline economic and demographic characteristics of counties that connected to the rail system during immigration booms and counties that connected to the railway during immigration lulls. That is, we replicate Tables 1 and A2 of Sequeira et al. (2020), which describes this analysis.[18] Second, we evaluate the validity of the instrument by considering the potential for pre-trends on our short-term outcomes. For this analysis, we consider the correlation between the predicted average immigrant share in a county across 1890-1920 decades with pre-1890 short-term outcomes. We consider three different pre-1890 outcome aggregations, 1860-1870, 1860-1880, and 1860-1890, as reported in Panels A to C of Appendix Table A.4. We find no significant correlation between the predicted migration after 1890 and any of the pre-1890 outcomes.

[16] Alternatively for both equations (2) and (3), we can use a county's total population in period $t-1$ as the denominator for the left-hand-side (LHS) variable to address any concern of net in- or out-migration affecting our results. Using this alternative divisor does not affect our results. As another alternative, we can use a county's total native population as the denominator for the LHS variable to rule out the mechanical effect of immigration inflow on the population growth. Using this alternative divisor enlarges the magnitude of the coefficient because it mechanically decreases the denominator and increases the magnitude of the LHS variable. Though we do not include the full set of results with these alternative LHS variable constructions, the results are available upon request.

[17] To implement Conley spatial standard errors, we use code from Hsiang (2010). In further robustness checks not reported in the paper, we include state by decade time trends. The results remain unchanged by the addition of these controls.

[18] We do not report results for the sake of brevity. County characteristics that are compared are from 1820-1840.

## 4.2 Long-term effects

To explore whether immigration during the Age of Mass Migration has had lasting effects on the arts industry, we focus on outcomes that reflect the robustness of arts communities in counties across the United States from the 1990s to today.

We begin by estimating the following ordinary least squares equation:

$$Y_{c,s} = \beta_1 \frac{1}{T} \sum_{t=1}^{T} \frac{I_{ct,s}}{Pop_{ct,s}} + \frac{1}{T} \sum_{t=1}^{T} \mathbf{X}_{ct,s}\Gamma + \mu_s + \epsilon_{c,s}. \tag{4}$$

In equation (4), the term $Y_{c,s}$ is the outcome of interest in county $c$ and state $s$. For example, this measure could be the average annual number of NEA grants awarded to individuals/organizations in a county over the past twenty years. The term $\frac{1}{T}\sum_{t=1}^{T} \frac{I_{ct,s}}{Pop_{ct,s}}$ summarizes the historical immigration county $c$ experienced during the AMM. In particular, the term represents the average share of immigrants in county $c$ and state $s$ over the county's population across years $t$, where $t \in \{1860, 1870, 1880, 1900, 1910, 1920\}$. The term $\frac{1}{T}\sum_{t=1}^{T} \mathbf{X}_{ct,s}$ represents the average county-, state-, and year-specific characteristics over the same historical time period. The term $\mu_s$ represents state fixed effects, which capture geographic and historical factors that may be similar among counties within a state. The coefficient of interest is $\beta_1$, which measures the effect of a county's average immigrant share between 1860 and 1920 on present day measures of arts prosperity.

### 4.2.1 Long-run instrument

Due to the same endogeneity concerns described in Section 4.1.1, we modify the short-run 2SLS specifications but to now analyze long-run effects. In particular, for our 2SLS specification we follow Sequeira et al. (2020) to estimate zero-, first-, and second-stage specifications, as represented by equations (5), (6), and (7) below.

We begin by estimating the following zero-stage equation:

$$\frac{I_{ct}}{Pop_{ct}} = \alpha_1 \frac{\Delta I_{t-1}}{Pop_{t-1}} \times I^{RR}_{c,t-1} + \alpha_2 I^{RR}_{c,t-1} + \alpha_3 \frac{I_{ct-1}}{Pop_{ct-1}} + \mathbf{X}_{ct-1}\Gamma + \mu_t + \mu_c + \nu_{ct} \tag{5}$$

which is identical to equation (2), the short-run first-stage. After estimating Equation (5), we calculate the immigrant share in each county and year that is predicted by the instrument:

$$\widehat{\frac{I_{ct}}{Pop_{ct}}} = \widehat{\alpha_1} \frac{\Delta I_{t-1}}{Pop_{t-1}} \times I^{RR}_{c,t-1}$$

where $\widehat{\alpha_1}$ is the estimate of $\alpha_1$ from equation (5). In the next step, we form a composite measure of the decade-by-decade estimates produced from equation (5) to study long-run outcomes. That is, we take the

average of the *predicted* immigrant shares over the decades 1860–1920:

$$\frac{1}{T}\sum_{t=1}^{\widehat{T}}\frac{I_{ct}}{Pop_{ct}} = \frac{1}{T}\sum_{t=1}^{T}\widehat{\alpha_1}\frac{\Delta I_{t-1}}{Pop_{t-1}} \times I^{RR}_{c,t-1}$$

.

We estimate the effect of immigration on measures of long-term arts development using $\frac{1}{T}\widehat{\sum_{t=1}^{T}\frac{I_{ct}}{Pop_{ct}}}$ as an instrument for the average historical immigrant share in county $c$ during the AMM. In the long-run analysis, the instrument exploits two sources of variation – differences in national level immigration levels at the time a county was connected to the railway *as well as* immigration levels in all subsequent connection decades.

Formally, we estimate the first- and second-stage equations given by equations (6) and (7).

$$Avg\ Immig\ Share_{c,s} = \alpha_1\frac{1}{T}\widehat{\sum_{t=1}^{T}\frac{I_{ct}}{Pop_{ct}}} + \mathbf{X}_{c,s}\Pi + \mu_s + \nu_{c,s} \tag{6}$$

$$Y_{c,s} = \beta_1 Avg\ Immig\ Share_{c,s} + \mathbf{X}_{c,s}\Gamma + \mu_s + \xi_{c,s} \tag{7}$$

where $c$ and $s$ index counties and states, respectively. The vector $\mathbf{X}_{ct,s}$ includes the interaction between average national GDP growth and connection to the railway $\frac{1}{T}\sum_{t=1}^{T}\hat{\alpha_3}\Delta GDP_{t-1} \times I^{RR}_{c,t-1}$, where $\hat{\alpha_3}$ is the coefficient estimate produced from the zero-stage equation. It also includes the interaction between average levels of industrialization and connection to the railway, and further controls for the duration of a county's connection to the railway as of 2000 to allow for the potential effects of earlier rail access on long-term outcomes. Finally, we also include polynomials for latitude and longitude in $\mathbf{X}_{ct,s}$ in order to control for the correlation between the instrument and county geographic characteristics.

# 5 Results

## 5.1 Short-term effects of immigration on native occupations

We first examine the impact of immigration during the AMM on outcomes in the same period. In Table 1 we report estimates of the effect of immigration on the share of natives working in arts-related occupations. The outcome of interest is the share of native artists normalized by county population, i.e., $\frac{Y_{ct}}{Pop_{ct}} = \frac{NA_{ct}}{Pop_{ct}}$, where $NA_{ct}$ is the number of natives working in arts occupations in county $c$ and period $t$.

We report OLS estimates in column (1) of Panel A in Table 1. The point estimate measuring the effect of immigration on the share of native artists in a county is small and not statistically different from zero.

However, given the endogeneity concerns with the OLS specification, we turn to our 2SLS estimation. We start with the first-stage results, reported in Panel B of Table 1. We find that predicted immigrant shares are strongly correlated with actual immigrant shares. The instrument yields a Kleibergen-Paap F-statistic of 24.[19] The magnitude of the point estimate using the instrument suggests that a one percentage point increase in the predicted immigrant share is associated with a 0.223 percentage point increase in the actual average immigrant share.

The second-stage estimates are reported in Panel A of Table 1. We again use the change in the share of native artists in a county as our outcome of interest. According to the 2SLS estimate in column (2), counties with larger immigration inflows observe significantly larger increases in the share of native artists. The magnitude of the coefficient suggests a one percentage point increase in the share of immigrants in a county increases the share of native artists in the same county by 0.076 percentage points, statistically significant at the 5% level.[20] The relatively larger magnitude of the 2SLS estimate, as compared to the OLS estimate, supports the theory that migrants located in areas that were both less economically attractive, and in complement, less likely to offer opportunities in the arts. Further, though the magnitudes alone do not appear large, it is important to note that the change is substantial relative to the average share of natives working as artists in this time period. During the AMM, the arts economy was in its emerging stages. According to Census data, about 80% of county-year observations had no artists. The average share of natives working as artists for all counties was 0.17%, and conditional on reporting *any* artists, the average share was 0.94%. Altogether, the results suggest that immigration during the AMM had a significant effect on the composition of native workers in the labor force in the short run, shifting natives toward occupations related to the arts.[21] [22]

To test the sensitivity of our short-run results, we consider whether the effect of immigration on arts development in the short-term could be driven by certain large metropolitan areas such as Los Angeles and New York. To test the sensitivity of our results to these potential outliers, we re-run the main analysis and iterate through counties in our sample, omitting one county a time. We plot the range of coefficients as well

[19] For subsequent tables, we do not repeat the reporting of F-statistics for estimations that use the same instrument and endogenous variable.

[20] We also show that our results are robust to adding state-by-year fixed effects in Appendix Table A.5.

[21] In the IPUMS USA Census 1% samples used for the outcome variables in this paper, we find that the average share of native artists in a county-decade is roughly between 0.06%-0.20%. The small shares in the short-run, coupled with the 1% sampling, may introduce uncertainty for the coefficient estimates if the full population is the object of interest (Abadie et al., 2017). Given this potential concern, we bootstrap the standard errors and our results are still statistically significant at 5% level. One might also wonder whether the low share of artists may be due to respondents holding other primary occupations, or be due to the self-reported nature of responses. This feature only impacts the interpretation of our empirical estimates *if* it is a source of systematic bias. However, it is unclear how underreporting of artistic occupations across locations would be correlated with our instrument (i.e., the interaction between national immigration flows and the gradual expansion of the railway network). In turn, it is unclear what direction underreporting of arts employment could systematically bias our estimates of the short-run impact of immigrants on natives' arts-related employment growth.

[22] We find similar results if we were instead to use a leave-out shift share design. We provide an example of this for the short-run arts occupations result in Appendix Table A.6.

as the confidence intervals of these analyses in Appendix Figure A.1. The figures show that our estimates are not driven by any single county.[23]

The effect of immigration on natives employing in artistic occupations may also take place more gradually. To examine this, we report the results from a lagged model where the right-hand side features the lagged share of migrants in Appendix Table A.7. The results are robust and even stronger if we use the lagged share of migrants as the independent variable.

## 5.2 Long-term effects of immigration on arts development

Beyond outcomes during the Age of Mass Migration, we also explore the persistent effects of historical immigration during that period on the arts. To study the long-term effects of immigration on the development of the arts sector, we highlight how immigration from roughly a century ago has affected the prosperity of arts communities in U.S. counties over the past few decades.

We first examine how historical immigration contributes to the establishment and presence of arts businesses in a county. To do this, we use the CBP data and 6-digit NAICS codes to count the number arts businesses and employees in a county. Arts establishments (with NAICS codes from 7111 to 7121) include organizations related to a range of arts activities. These businesses include theaters, dance studios, musical groups, and museums, among others. Arts employees include individuals working in the types of establishments above, as well as agents, managers for artists, and other public figures. We report estimates for the effect of immigration on the logarithm number of arts businesses and employees of arts businesses in Table 2. The OLS estimate in column (1) suggests that a one percentage point increase in the average historical immigrant share in a county between 1860 and 1920 contributes to a 2% increase relative to the mean. Column (2) in Panel B reports results from the first-stage when we instead use the railway instrument. The first stage results suggests that a one percentage point increase in the average predicted immigrant share is associated with a 4.6 percentage point increase in the actual historical immigrant share in a county. The Kleibergen Paap F-statistic is 28.2, indicating the strong predictive power of the instrument. Column (2) of Panel A reports the second-stage estimate, which is larger in magnitude than the estimate in the OLS specification. A one percentage point increase in the average historical immigrant share contributes to a 16% increase relative to the mean.[24]

We also examine the effect of historical immigration on the number of employees in arts businesses, reported as a share of the county population. The results are reported in columns (3) and (4) of Table 2.

[23] We also show in residual plots of the first- and second-stage in Appendix Figures A.2 and A.3 that our results are not driven by outliers.

[24] We show in Panel C of Appendix Table A.8 that our long-term results are robust to examining a balanced panel of counties who have the same boundaries from 1860 to 2000, as is done in Sequeira et al. (2020). We note that some outcomes are qualitatively consistent but are no longer statistically significant given the smaller sample size.

The OLS estimate in column (3) suggests that immigration during the AMM had a positive effect on the share of employees in arts businesses today. A one percentage point increase in the average historical immigrant share in a county contributes to a 0.011 percentage point increase in share of employees in arts businesses. The 2SLS estimate in column (4) suggests a one percentage point increase in the average historical immigrant share contributes to a 0.012 percentage point increase in share of employees in arts businesses, though not statistically significant.

In complement to the CBP data, we leverage NCCS data that has aggregated information on U.S-based nonprofits since 1987. These data also list organizations by their primary cause, which allows us to identify arts organizations. In Table 3, we report the results from this analysis. Our outcome of interest for columns (1) and (2) is the logarithm number of arts nonprofits in a county per year. The OLS estimate in column (1) suggests that a one percentage point increase in the average historical immigrant share in a county contributes to a 5% increase relative to the mean. Column (2) reports the second-stage results using the railway instrument, and describes a positive effect of larger magnitude than the OLS estimate. A one percentage point increase in the average historical immigrant share contributes to a 19% increase relative to the mean.

Not only do the results suggest a greater presence of arts nonprofits in counties with greater historical immigration, but subsequent analyses demonstrate that these institutions are successful and contribute other positive benefits to the community. In these analyses, we proxy for the prosperity of arts institutions through a few different measures. First, in columns (3) and (4) of Table 3, we examine the average annual inflation-adjusted revenue that arts nonprofits receive. The results show for every one percentage point increase in the average historical immigrant share in a county, arts institutions earn 3.6% more in average revenue. Although the second-stage estimate in the 2SLS specification is no longer statistically significant, the point estimate remains consistent with the OLS estimate.

To continue measuring the success of arts organizations, we use data on NEA grant recipients over the past two decades. For our outcomes in Table 4, we use the average annual number NEA grant recipients in a county, and the average annual inflation-adjusted value of those grant awards. In particular, the dependent variable in columns (1) and (2) is the log of the average number of NEA art grants in county $c$ between 1998 and 2020. The dependent variable in columns (3) and (4) is the log of the average art grant award amount in county $c$ between 1998 and 2020.

The OLS estimates in columns (1) and (3) suggests that a one percentage point increase in a county's average immigrant share during the Age of Mass Migration contributes to a 6.4% increase in the average number of NEA grants received by arts groups in that county; in complement, the average value of NEA grant award amounts increases by 7.4%. Columns (2) and (4) report the second-stage estimates and suggest

a larger long-term impact of historical immigration than estimated by OLS. The coefficients imply that for every one percentage point increase in the average historical immigrant share in a county, the average number of NEA grants awarded to art nonprofits in the same location increases by 25%, and the average value of those NEA grants increases by 27%.

The long-run results demonstrate the lasting effects of immigration during the AMM on arts communities. Today, areas that received larger numbers of immigrants during the AMM have more arts businesses and nonprofits. These businesses employ a larger share of the population, earn more revenue, and have been awarded more NEA grants. We note that these results are not driven by outliers. We re-run the main analysis after dropping the five largest counties by population in the United States, in addition to specifications where we exclude Los Angeles and New York City. Our results are robust to these alternative specifications, as reported in Panels A and B of Appendix Table A.8. [25] Further, a consistent pattern across these results is that the 2SLS estimates are larger than the OLS estimates, suggesting that the OLS estimates are biased downward. Altogether, the results regarding the positive growth of the arts industry, as well as the downward bias of the OLS estimates, is consistent with prior work (Sequeira et al., 2020).

# 6 Mechanisms

In this section, we explore the potential mechanisms behind how AMM immigration impacted the growth of the American arts. Though not exhaustive, our analysis of underlying channels is larger in scope than past work. As part of this exercise, we first consider a natural channel through which these benefits could have manifested; namely, the transfer of arts skills and knowledge from immigrant artists to natives in the short run. Moving forward, however, our exploration of mechanisms broadens in scope. We find patterns that suggest that the sharing of arts experiences and transmission of arts preferences from immigrants, including those without arts backgrounds, to native communities could have formed a basis for the creation of new arts markets. Specifically, we find positive links between the presence of immigrants arriving from certain European regions and the growth of art forms popular in those areas.

Moving to the long-run, we note that many of the underlying mechanisms behind the short-run effects likely persist for long-run arts development. Additionally, prior work has documented the benefits of AMM immigration to long-run local economic prosperity Sequeira et al. (2020). To better understand these channels, we run a causal mediation analysis, in addition to other indirect tests, to offer suggestive evidence regarding the extent to which the long-run growth of the arts is connected to improved economic conditions.

[25] Similar to our short-term results, Appendix Figures A.4-A.6 show that our estimates are not driven by any single county. We also show in residual plots of the first- and second-stage in Appendix Figures A.7 and A.8 that the results are not driven by outliers, with arts establishments as the outcome.

Though our analysis shows a meaningful effect of long-run economic development on arts outcomes, we continue to find significant direct effects of AMM immigration. We argue that the results reflect the important role of both local income growth and the persistence of the early diffusion of arts preferences and practices from over a century ago to long-run arts sector growth.

## 6.1 Transfers of arts skills, or broader diffusion of interest in the arts?

Arts development in America could have been driven by knowledge transfers from immigrant artists to natives. The effect of immigration on the arts could have also been more expansive. Benefits may have accrued due to the increased frequency of interactions between immigrant and native cultures and customs, irrespective of whether immigrants worked in the arts. In Table 5, we examine the influence of immigrants with and without arts backgrounds separately on native occupational choices.[26] As shown in both columns (2) and (4), we find a significant effect of both immigrant artists and non-artists on the share of natives employed in the arts. The 2SLS point estimate in column (2) of Table 5 shows that for every one percentage point increase in the share of migrant artists in a county, the share of native artists in that location increases by 0.539 percentage points, a result that is consistent with the main findings from Borowiecki and Graddy (2021). The 2SLS point estimate in column (4) of Table 5 shows that for every one percentage point increase in the share of non-artist migrants in a county, the share of native artists in that location increases by 0.047 percentage points. While the latter estimate is smaller in magnitude, the estimates are not significantly different from one another ($p$ =0.26). We interpret these results as evidence that immigrants with existing arts skills, and immigrants without those characteristics, both contributed to the development of the arts. The result regarding the impact of immigrant non-artists suggests that immigration as a whole expanded artistic capacity among natives.[27]

We can also explore whether greater immigration in a location attracted native artists from other areas in the U.S. who sought new collaborations in emerging arts communities, or whether the growth was driven by increased arts employment among natives already in the area. In Table 6, we find that greater immigration into a county increases the share of native artists from the same area, but does not affect the share of native artists originating from other areas of the United States. Our finding on the effect of *aggregate* immigration on the number of new native artists from the same location complements Borowiecki and Graddy (2021), who observe positive impacts of immigrant artist inflows on local native artist growth. Our result on the lack of an effect of *aggregate* immigration on native artists migrating *within* the U.S. complements the positive

[26] For this analysis of mechanisms, we cannot use the NHGIS data as it does not have individual occupation data, but the IPUMS Census 1% samples, which do include this variable.

[27] While ideally we would use national level inflows for immigrant *artists* and *non-artists* separately for each population estimate, the passenger list data from Willcox (1929) do not include individual occupations.

effects of immigrant *artists* on the migrating native population found in Borowiecki and Graddy (2021). We believe our results further support the role of factors outside of specialized arts knowledge generation between immigrant and native artists. These outside factors include, for example, the broader diffusion of arts experiences from the general immigrant community.

Finally, to further understand how the arts sector developed in the short run, we document whether the increase in natives employed in the arts sector consisted of individuals from immigrant families (i.e., second generation immigrants) or individuals from families with established roots in the United States. The former relationship would suggest a vertical form of cultural transfer, in contrast to horizontal diffusion through broader community interactions in the latter association. We report the results from this analysis in Table 7. The dependent variable in column (1) is the share of the second-generation immigrant population working in arts occupations. The dependent variable in column (2) is the share of the non-second-generation immigrant population employed in arts occupations. Our results show that immigration did not meaningfully impact the share of second-generation immigrants working in arts occupations; instead, the results show that immigration had a positive effect on non-second-generation immigrants. The latter coefficient is similar to the 2SLS estimate provided in Table 1 when evaluating the aggregate impact of immigration. The results across Table 7 columns illuminate how immigrants likely influenced arts growth beyond immediate immigrant families and instead through interaction with natives.

## 6.2 Beyond arts skills transfers: cultural influences of sending regions

If immigration helped boost native engagement with the arts by exposing them to new experiences and ideas, we might expect to find a positive association between region-specific immigrant shares for sending countries known for their originality in a particular form of art, and the number of natives working in those specific fields.[28] For example, during the Age of Mass Migration, France was a leader in arts fields such as sculpture and architecture, producing renowned sculptors such as Auguste Rodin and a multitude of important architects in the 19th century (Lee, 2016; Widewalls, 2016; Artsy, 2015). We might then expect U.S. counties with larger numbers of French immigrants to also have larger numbers of natives working in sculpture and architecture.

In Table 8, we examine the association between French immigrants and native sculptors and architects in a county in the short run. We also test for the association between sculptors and architects and non-French immigrants. We conduct a similar analysis with German and Austrian immigrants, but now looking at natives in music occupations, given the region's rich history in this art form (Kralik et al., 1959). Finally,

[28]Recently, transmission of novel experiences and ideas in the arts has been studied in the context of teacher influence on students of music composition (Borowiecki, 2022).

we review the connection between British immigrants and natives working as authors or writers, given the notable history of English literature (see, e.g., Davies, 1990).[29]

More precisely, we re-estimate variants of equations (2) and (3), where instead of using national level inflows of *all immigrants* (interacted with the expansion of the railway network), we use national level inflows of *immigrants from the relevant sending region*. Specifically, we estimate equation (2), regressing our outcome on the French immigrant share and non-French immigrant share separately, and then use the two predicted values to estimate equation (3) (similarly for Austrian and German (British) immigrant and Non-Austrian and German (British) immigrant shares). The estimates in column (1) of Table 8 highlight that French immigrant inflows to a county are positively and significantly associated with native sculptor and architect shares in the same location in the subsequent decade; meanwhile non-French immigrant inflows to a county are not significantly associated with the outcome. Turning to music, counties with larger share of German and Austrian immigrants also have greater native musician shares, while the share of non-German or Austrian immigrants in a county does not positively predict the share of native employed as musicians (column (2)). For authors and writers, counties with larger shares of British immigrants have greater native author shares, while the share of non-British immigrants in a county has no such effect. We take this further evidence to suggest that immigration impacted native occupational choices in the short-term by cultivating tastes for specific forms of art.

### 6.3 Income effects in the long run

Though the immediate diffusion of arts preferences during the Age of Mass Migration may have had persistent effects over many decades, past work has also documented how immigration during this period led to long-run growth in income and general economic prosperity (Sequeira et al., 2020). Communities with greater financial resources in the long run may also have greater ability to invest in arts and cultural opportunities. To examine the importance of income effects to the long-run development of the arts, we run a mediation analysis with instrumental variables (Dippel et al., 2020a,b). The mediation analysis also produces estimates for "direct" effects, which we interpret as including (but not limited to) the exchange of new arts experiences, preferences, and ideas during the AMM, on arts community outcomes today. The key assumption when employing the IV mediation analysis, as described in Dippel et al. (2020b), is that confounding factors between treatment (immigration in our case) and the mediator (income in our case) and confounding factors between the mediator (income in our case) and final outcome (development of arts) are independent of

[29] We also note that the prominence of these particular forms of art are reflected in the number of well-known artists produced by these countries-of-origin. We find that Wikipedia lists of artist pages by country-of-origin (which may serve as a proxy for an individual's popularity or fame) for each form of art, reflect these country-of-origin patterns. See, e.g.: https://en.wikipedia.org/wiki/Category:19th-century_musicians_by_nationality; https://en.wikipedia.org/wiki/Category:19th-century_sculptors; https://en.wikipedia.org/wiki/Category:19th-century_writers_by_nationality

one another. We understand that this is a strong assumption and may not hold in our case. Therefore, we approach this analysis with caution, and view the results as offering suggestive evidence regarding the complementary role of both income effects and direct effects, as defined above.

Table 9 reports the causal mediation analysis results. Each column represents a different long-run outcome, while the mediating variable is 1980 county median income. While we see variation in both the coefficient magnitudes for the indirect income effect and its estimated share of the total effect, some general patterns emerge. First, across Table 9, we see that a meaningful share of the total effect of historical immigration on long-run outcomes is connected to the income channel, although the estimates are not precisely estimated and not statistically significant.[30] Outside of nonprofit revenues, the income effect accounts for as low as 35% (arts employees as a share of total county employees) to as high as 77% (arts businesses) of the total effect. Second, though smaller in magnitude, the direct effects of AMM immigration on long run outcomes are statistically significant. We interpret the latter result as evidence that the exchange of arts preferences and activities early on may have continued into the long run in locations who experienced greater historical immigration.

To complement our long-run analysis, we provide additional suggestive tests of the role of economic growth on the arts in the short run. In particular, we test whether the number of native artists in the population grew faster than total employment during the Age of Mass Migration. If arts benefits in the short run are primarily attributable to economic growth, we may see that the number of native artists grows at no different rate than total employment. We would then expect the number of native artists as a share of the employed population to be left unchanged. Because employment variables may not be reported systematically across Census years, in Table 10 we report results from our short-run empirical specifications where we scale our outcomes by the county population in the labor force (columns 1 and 2), or by the number of individuals who have a non-missing occupational score (columns 3 and 4). The 2SLS estimates in columns (2) and (4) show that our short-run results remain significant, suggesting that greater economic productivity alone may not explain the growth of the arts industry during the AMM. Taken together, we view the results from the causal mediation analysis and indirect tests as pointing to a meaningful role of direct channels such as the exchange of arts preferences through greater frequency of cross-community interaction. However, the results also show the contribution of income effects on the development and increased capacity of the American arts.

[30] The only outcome where the indirect income effect does not appear to affect the long-run arts outcome is nonprofit revenues.

## 6.4 Heterogeneity analyses

Though our results to this point note the positive impact of immigration on the arts overall, it may be that immigration benefited certain arts fields more than others. To explore heterogeneous effects, we rerun our short-run instrumental variables empirical specification. Instead of exploring changes to native artists in aggregate, we estimate the effects on native occupational decisions separately for visual artists, actors, musicians, and authors. We also rerun our long-run empirical specification estimating the impact of historical immigration on the number of awarded NEA grants. We now use information on the grant sub-field to examine the effects on grants related to dance, music, visual arts, literary arts, arts exhibits, and arts promotion initiatives independently.

In Appendix Tables A.9 and A.10, the short- and long-run findings point to benefits across multiple arts fields. In the short run, we find that immigration leads to a larger number of natives employed as visual artists, actors, and musicians. The effects for each occupation are similar in magnitude, although only the estimate for actors is statistically significant at conventional levels. The lack of statistical significance for the other occupations is not surprising, as we lack statistical power when exploring occupational subgroups. In the long run, we find that historical immigration into a county leads to a larger number of awarded NEA grants across many types of art. For instance, historical immigration leads to more grants in traditional areas such as music, which includes musical theater and opera. However, historical immigration also appears to benefit more modern forms of art such as media arts (included in literary arts) and initiatives for arts research, program innovation, and education.

## 6.5 Geographic spillovers

While our geographic unit of interest is the U.S. county, it is possible that the effects of immigration on local arts development could be broader in geographic scope. To investigate the spillover effects of immigration on arts development in adjacent counties, we weight each neighboring county equally and include the average immigration share among all neighboring counties in the OLS and 2SLS specifications. For the 2SLS approach, we apply the average of the interaction between railway access and national immigration inflows across all adjacent counties as an additional instrument to predict the average immigration share among all the neighboring counties. For the short-run results, we use the share of native artists as the outcome of interest. For the long-run results, we use the number of arts businesses and nonprofits as the outcomes of interest. The results are presented in Appendix Table A.11 and Table A.12. In both the short and long run, the effect of immigration in adjacent counties on the various arts outcomes are small and not statistically different from zero.

Though we do not find any geographic spillovers, we might be independently concerned about the potential for spatial autocorrelation bias to affect our long-run estimates. Following Kelly (2019), we calculate the Moran's I statistic for each of our long-run outcomes. We find that the Moran's I statistics for most of the long-run variables, including the share of employees in arts business, number of arts nonprofits, arts nonprofit revenue, NEA arts grants, and grant value, are around 0.1. The small magnitudes of Moran's I statistics suggests that our long-run estimates are unlikely to be subject to spatial autocorrelation bias.

### 6.6 Medium-term effects of immigration on arts development

Much of our work focuses on either the immediate short-run effects of immigration during the AMM, or long-run impacts roughly a century later. We also provide estimates of the impact of immigration in the medium-term, i.e., from 1930-1940. This analysis mimics the empirical strategy used on long-term outcomes. Our first outcome is natives in arts occupations in 1940. We also examine Federal Theatre Project (FTP) productions held between 1935-1939. Data for productions is included in the Library of Congress's FTP collection (Library of Congress, 2021). The FTP was one of multiple arts-related New Deal programs enacted after the Great Depression in the United States. FTP productions were intended to get struggling artists back to work and to boost American morale.

The results described in Appendix Table A.13 show that a one percentage point increase in the average immigrant share over the prior half century significantly increased the share of natives working in the arts by 0.014 percentage points in 1940, an effect of approximately 7 percent relative to the mean. The results also suggest that a greater number of Federal Theatre Project productions were held in counties with greater immigration over the prior half-century. The latter effects regarding FTP plays are not statistically significant as we lack power to make meaningful conclusions from this analysis. However, we interpret direction of the coefficient estimates to be qualitatively consistent with our main results.

### 6.7 Migration effects beyond the Age of Mass Migration

In addition to the Age of Mass Migration, the United States has experienced other meaningful domestic and international migration over the past century. With respect to domestic migration, large numbers of Southern black residents left the South and moved to Northern cities during the Great Migration (Collins, 2021). The United States has also experienced a Second Age of Mass Migration over the past few decades, receiving a greater number of immigrants from Asia and Latin America (Abramitzky et al., 2020). Each of these major population shifts could have impacted the long-run development of the arts sector, independent of the impact of immigration during the Age of Mass Migration. Though we acknowledge the significance

of each of these population movements, our primary question is centered on immigration and not domestic migration. Further, we are interested with the persistent effects of immigration and focusing on recent immigration waves would limit our ability to address consequences relevant to this long-term time frame.

However, one might be concerned that our long term-effects are capturing the impacts of more recent migration events. We offer initial evidence suggesting that the effects of other migration events in the US were orthogonal to the impact of the AMM on the arts. In particular, Appendix Table A.14 tests the robustness of the long-run results reported in Tables 2, 3, and 4, to the impact of other significant migration events. To proxy for the potential effect of the Great Migration on arts development, we include a control for the change in the share of black residents in a county between 1920 and 1970. To proxy for the potential impact of recent immigration waves, we include a measure for the immigrant share in a county as of 2000. In Appendix Table A.14, we find that the long-run results are not affected by the inclusion of proxy measures for other meaningful migration events.

# 7 Conclusion

When immigrants arrive in new environments, they share a diversity of cultures, skills, and experiences with their communities. The novel connections between immigrants and natives have led to important advances in many domains. In the sciences, researchers have found that inflows of Jewish emigres in the mid-20th century increased patents and inventions in the research areas of the scientists, while immigration quotas in the 1920s reduced innovation (Moser et al., 2014; Moser and San, 2020). In both cases, knowledge flows between migrant and native populations were central to the impact on scientific innovative capacity.

The arts is another arena where several narratives have been written about the contributions of immigrants and the profitable experiences of interacting with, and learning from, them. In this paper, we explore the impact of immigration on the growth of the arts sector in the United States. We focus on immigration during the Age of Mass Migration, a time when American communities changed considerably as individuals were exposed to many new cultures and practices, predominantly from new regions across Europe. By studying this particular migration event, we are able to examine both short- and long-run effects. To address potential identification concerns with using ordinary least squares estimates, we adopt an instrumental variables strategy.

In the short run, we find that immigration had a significant effect on native work during the Age of Mass Migration. Increases in immigrant inflows into a county led to significant shifts in native work toward arts-related occupations. The new arts presences cultivated in areas with greater historical immigration continue over a century later. These communities have more arts businesses and non-profit organizations

in their jurisdiction. These arts institutions employ a larger share of county populations, generate more revenue, and receive a larger number of National Endowment of the Arts grants.

Our analysis not only documents positive arts outcomes, but provides a critical exploration of multiple plausible mechanisms behind the contributions of immigration to the arts. By doing so, this paper broadens our understanding of how immigrants have shaped development in the United States. Though we focus on the Age of Mass Migration, we do not suggest that other waves of immigration or migration events did not influence the American arts. On the contrary, immigrants from a diverse set of countries and regions have established roots across America throughout the 20th and 21st century. Major population movements within the United States, such as the Great Migration, may have also influenced artistic innovation in the country. Another pertinent example may be migration occurring during 20th century war time, where migration flows not only had the potential to reshape arts in the United States, but changed the landscape of arts communities in European cities (e.g., O'Hagan and Borowiecki, 2010; Borowiecki and O'Hagan, 2012). We also acknowledge that the definition of art continues to evolve, and therefore new forms of art have been developed over the past century. We view our analysis as an initial exploration of the impact of immigration on more traditional categories of art. Future work may explore the effects of migration outside of the AMM, as well as the impact of immigration on the development of newer forms of art.

Overall, our results suggest that immigrants have made significant contributions to the early growth, and continued success, of the American arts economy. Our results with regards to the positive role immigrants in the arts parallels exciting research that has documented how immigrants spurred innovation in the sciences. Further, our work exploring the arts also reinforces research emphasizes the important contributions of immigrant artists in building the American arts sector (Borowiecki and Graddy, 2021). In total, we add our support to the arguments of other researchers who have highlighted the multidimensional role of immigrants in U.S. communities, both in the past and in the present.

## Acknowledgements

We thank Karol J. Borowiecki, George Borjas, David Card, Jason Cook, Joseph Doyle, Claire Duquennois, Osea Giuntella, Mathias Fjællegaard Jensen, Hillel Rapoport, Sandra Rozo, Albert Saiz, Frank Schilbach, Allison Shertzer, Riley Wilson, Noam Yuchtman, and seminar/conference participants at the SOLE, SEHO, AASLE, the 17th IZA Annual Migration Meeting, the IV and V Workshop on Migration, Health, and Well-being, the Econometric Society Asian Meeting, the Econometric Society China Meeting, University of Oxford, and University of Pittsburgh. All errors are our own. The authors declare no conflicts of interest. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit

sectors. Data and replication files will be made available in an Online Appendix.

# References


**Abadie, Alberto, Susan Athey, Guido W Imbens, and Jeffrey Wooldridge**, "When Should You Adjust Standard Errors for Clustering?," Technical Report, National Bureau of Economic Research 2017.

**Abramitzky, Ran and Leah Boustan**, "Immigration in American Economic History," *Journal of Economic Literature*, 2017, *55* (4), 1311–1345.

**_ , _ , and Katherine Eriksson**, "Do Immigrants Assimilate More Slowly Today Than in the Past?," *American Economic Review: Insights*, 2020, pp. 125–141.

**_ , Leah Platt Boustan, and Katherine Eriksson**, "A Nation of Immigrants: Assimilation and Economic Outcomes in the Age of Mass Migration," *Journal of Political Economy*, 2014, *122* (3), 467–506.

**Akcigit, Ufuk, John Grigsby, and Tom Nicholas**, "Immigration and the Rise of American Ingenuity," *American Economic Review: Papers & Proceedings*, 2017, *107* (5), 327–331.

**Artsy**, "French Art History in a Nutshell," 2015. Artsy.

**Azoulay, Pierre, Benjamin Jones, J. Daniel Kim, and Javier Miranda**, "Immigration and Entrepreneurship in the United States," 2020. NBER Working Paper No. 27778.

**Borjas, George J. and Kirk B. Doran**, "The Collapse of the Soviet Union and the Productivity of American Mathematicians," *Quarterly Journal of Economics*, 2012, *127* (3), 1143–1203.

**Borowiecki, Karol J. and John O'Hagan**, "Historical Patterns Based on Automatically Extracted Data: The Case of Classical Composers," *Historical Social Research*, 2012, *37*, 298–314.

**Borowiecki, Karol Jan**, "The Origins of Creativity: The Case of the Arts in the United States since 1850," *Working Paper*, 2019.

_ , "Good Reverberations? Teacher Influencein Music Composition since 1450," *Journal of Political Economy*, 2022, *130* (4), 991–1090.

_ **and Kathryn Graddy**, "Immigrant Artists: Enrichment or Displacement," *Journal of Economic Behavior and Organization*, 2021, *191*, 785–797.

**Botella, Marion and Todd Lubart**, "Creative Processes: Art, Design and Science," in G.E. Corazza and S Agnoli, eds., *Multidisciplinary Contributions to the Science of Creative Thinking*, Springer Science+Business Media Singapore, 2016, pp. 53–65.

**Burchardi, Konrad B, Thomas Chaney, Tarek Alexander Hassan, Lisa Tarquinio, and Stephen J Terry**, "Immigration, Innovation, and Growth," Technical Report, National Bureau of Economic Research 2020.

**Collins, William J.**, "The Great Migration of Black Americans from the US South: A Guide and Interpretation," *Explorations in Economic History*, 2021.

**Conley, Tim**, "GMM Estimation with Cross Sectional Dependence," *Journal of Econometrics*, 1998, *92* (1), 1–45.

_ , "Spatial Econometrics," in S.N. Durlauf and L.E. Blume, eds., *New Palgrave Dictionary of Economics*, 2008, pp. 741–747.

**Cotter, Sara**, "Straddling the Atlantic: European Influences on the American Art of the Weir Family," 2012.

**Daniels, Roger**, *Coming to America: A History of Immigration and Ethnicity in American Life*, Harper Perennial, 2002.

**Davies, Marion Wynne**, "A Bloomsbury Guide to English Literature," 1990.

**Dippel, Christian, Andreas Ferrara, and Stephan Heblich**, "Causal Mediation Analysis in Instrumental-Variables Regressions," *The Stata Journal*, 2020, *20* (3), 613–626.

**_ , Robert Gold, Stephan Heblich, and Rodrigo Pinto**, "Mediation Analysis in IV Settings With a Single Instrument," *Working Paper*, 2020.

**Doran, Kirk and Chungeun Yoon**, "Immigration and Invention: Evidence from the Quota Acts," *Working Paper*, 2020.

**Erickson, Heidi H., Angela R. Watson, and Greene Jay P.**, "An Experimental Evaluation of Culturally Enriching Field Trips," *Journal of Human Resources*, 2022.

**Falck, Oliver, Michael Fritsch, and Stephan Heblich**, "The phantom of the opera: Cultural amenities, human capital, and regional economic growth," *Labour Economics*, 2011, *18*, 755–66.

**Faulkner, Harold Underwood**, *American Economic History*, Harper and Row Publishers, 1960.

**Feinberg, Jody**, "Art Shows Explore Immigration and the American Dream," *The Patriot Ledger*, 2019.

**Foerster, Robert**, *The American Immigration Collection*, Arno Press Inc., 1969.

**Furnham, Adrian, Mark Batey, Tom W. Booth, Vikita Patel, and Dariya Lozinskaya**, "Individual Difference Predictors of Creativity in Art and Science Students," *Thinking Skills and Creativity*, 2011, *6*, 114–121.

**Giuliano, Paola and Marco Tabellini**, "The Seeds of Ideology: Historical Immigration and Political Preferences in the United States," *Harvard Business School Working Paper 20-118*, 2021.

**Glueck, Grace**, "European Influences on Americans' Views," *New York Times*, 2004.

**Hanshumaker, James**, "The Effects of Arts Education on Intellectual and Social Development: A Review of Selected Research," *Bulletin of the Council for Research in Music Education*, 1980, pp. 10–28.

**Hatton, Timothy J. and Jeffrey G. Williamson**, *Global Migration and the World Economy: Two Centuries of Policy and Performance*, MIT Press, 2005.

**Hirschman, Charles**, "The Contributions of Immigrants to American Culture," *Daedalus*, 2013, *142* (3), 26–47.

**Hsiang, Solomon M.**, "Temperatures and Cyclones Strongly Associated with Economic Production in the Caribbean and Central America," *Proceedings of the National Academy of Sciences*, 2010, *107* (35), 15367–15372.

**Hunt, Jennifer and Marjolaine Gauthier-Loiselle**, "How Much Does Immigration Boost Innovation?," *American Economic Journal: Macroeconomics*, 2010, *2* (2), 31–56.

**Kelly, Elish and John O'Hagan**, "Geographic Clustering of Economic Activity: The Case of Prominent Western Visual Artists," *Journal of Cultural Economics*, 2007, *31*, 109–128.

**Kelly, Morgan**, "The Standard Errors of Persistence," 2019.

**Kerr, Sari Pekkala and William R. Kerr**, "Immigrant Entrepreneurship in America: Evidence from the Survey of Business Owners 2008 & 2012," 2018. NBER Working Paper No. 24494.

**Kerr, William R and William F Lincoln**, "The Supply Side of Innovation: H-1B Visa Reforms and US Ethnic Invention," *Journal of Labor Economics*, 2010, *28* (3), 473–508.

**Khanna, Gaurav and Munseob Lee**, "High-Skill Immigration, Innovation, and Creative Destruction," 2018. NBER Working Paper No. 24824.

**Kralik, Heinrich, Othmar Wessely, and Beatrix Kempf**, *Austria: Land of Music*, Press and Information Service of the Austrian Government, 1959.

**Kuld, Lukas, Sara Mitchell, and Christiane Hellmanzik**, "Manhattan Transfer: Productivity Effects of Agglomeration in American Authorship," *Working Paper*, 2021.

**Lee, Patina**, "The Evolution of French Architecture," 2016. Widewalls Magazine.

**Library of Congress**, "About this Collection: Federal Theatre Project, 1935 to 1939," 2021. Available from: https://www.loc.gov/collections/federal-theatre-project-1935-to-1939/about-this-collection/.

**Mazzolari, Francesca and David Neumark**, "Immigration and Product Diversity," *Journal of Population Economics*, 2012, *25* (3), 1107–1137.

**Miller, Angela L., Janet C. Berlo, Bryan J. Wolf, and Jennifer L. Roberts**, *American Encounters: Art, History, and Cultural Identity*, Washington University Libraries, 2008.

**Moser, Petra, Alessandra Voena, and Fabian Waldinger**, "German Jewish Emigres and US Invention," *American Economic Review*, 2014, *104* (10), 3222–3255.

__ **and Shmuel San**, "Immigration, Science, and Invention. Lessons from the Quota Acts," *Working Paper*, 2020.

**National Center for Charitable Statistics**, "Core File 1989-2013 Public Charities Fiscal Year Trend [data set]," *Urban Institute*, 2020. Available from: http://nccs-data.urban.org.

**National Endowment for the Arts**, "Grant Database: Recent Grants [data set]," 2021. Available from: https://apps.nea.gov/grantsearch/.

**O'Hagan, John and Christiane Hellmanzik**, "Clustering and Migration of Important Visual Artists: Broad Historical Evidence," *Historical Methods*, 2008, *41*, 121–136.

__ **and Karol Jan Borowiecki**, "Birth Location, Migration, and Clustering of Important Composers," *Historical Methods*, 2010, *43*, 81–90.

**Ottaviano, Gianmarco I.P. and Giovanni Peri**, "The Economic Value of Cultural Diversity: Evidence from US Cities," *Journal of Economic Geography*, 2006, *6*, 9–44.

**Pareles, Jon**, "Immigrants Created American Music. A New Festival Tells Their Stories," *New York Times*, 2019.

**Ruggles, Steven, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas, and Matthew Sobek**, "IPUMS USA: Version 10.0 [data set]," 2020.

**Scheffler, Samuel**, "Immigration and the Significance of Culture," in "Nationalism and Multiculturalism in a World of Immigration," Springer, 2009, pp. 119–150.

**Secker, Jenny, Mick Loughran, Kirsten Heydinrych, and Lyn Kent**, "Promoting Mental Well-being and Social Inclusion Through Art: Evaluation of an Arts and Mental Health Project," *Arts & Health*, 2011, pp. 51–60.

**Sequeira, Sandra, Nathan Nunn, and Nancy Qian**, "Immigrants and The Making of America," *The Review of Economic Studies*, 2020, *87* (1), 382–419.

**Smith, Laura, Brieahn DeMeo, and Sunny Widmann**, "Identity, Migration, and the Arts: Three Case Studies of Translocal Communities," *The Journal of Arts Management, Law, and Society*, 2011, *41* (3), 186–197.

**Tabellini, Marco**, "Gifts of the Immigrants, Woes of the Natives: Lessons from the Age of Mass Migration," *The Review of Economic Studies*, 2020, *87* (1), 454–486.

**Widewalls**, "French Art History," 2016. Widewalls Magazine.

**Willcox, Walter F.**, *International Migrations, Volume I: Statistics*, National Bureau of Economic Research, 1929.

**Yu, Brandon**, "Kumail Nanjiani on 'Little America' and Hopeful Immigrant Stories," *The New York Times*, 2020.

Table 1: Short-run effects of immigration on natives working in arts occupations

| | (1) OLS | (2) 2SLS: Lag Rail Access x Lag Immigration Inflow |
|---|---|---|
| **Panel A: OLS and 2SLS** | Dependent Variable: *Native Artist Share* | |
| *Immigrant Share* | -0.003 | 0.076** |
| Cluster SE | (0.002) | (0.033) |
| Conley SE | | [0.003] |
| Mean of Dep. Var. | 0.17% | 0.17% |
| Std. Dev. of Dep. Var. | 0.53% | 0.53% |
| Observations | 12,353 | 12,353 |
| **Panel B: First Stage** | Dependent Variable: *Immigrant Share* | |
| Lag Rail Access | | 0.223*** |
| x Lag Immigration Inflow | | (0.045) |
| Kleibergen Paap F-statistic | | 23.63 |
| Controls (in all panels) | | |
| Lag Rail Access | Yes | Yes |
| Lag Immigration Share | Yes | Yes |
| Lag Urbanization Dummy | Yes | Yes |
| Log County Population Density | Yes | Yes |
| Lag Urbanization Dummy | Yes | Yes |
| x Lag Immigration Inflow Share | | |
| Lag Rail Access | Yes | Yes |
| x Lag GDP Growth | | |
| Lag Rail Access | Yes | Yes |
| x Lag Log Industrialization Index | | |
| Log County Population Density | Yes | Yes |
| County Fixed Effects | Yes | Yes |
| Year Fixed Effects | Yes | Yes |

Note: This table shows the short-run effects of immigration on the share of the native population working in arts-related jobs. Column (1) in panel A reports the OLS estimate. Columns (2) in panel A reports 2SLS estimate. The variable "*Native Artist Share*" is the share of a county's population that is working in an arts-related occupation in period $t$. The variable "*Immigrant Share*" is the share of a county's population that is foreign-born in period $t$. Column (2) in panel B reports the first stage estimate. Standard errors clustered at the county level are reported in parentheses and Conley standard errors that use a five-degree window are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 2: Long run effects of immigration on arts businesses

| | (1) OLS | (2) 2SLS | (3) OLS | (4) 2SLS |
|---|---|---|---|---|
| **Panel A: OLS and 2SLS** | Dependent Variable: | | | |
| | *Log No. of Businesses* | | *Employee Share* | |
| *Avg. Immigrant Share* | 2.001*** | 15.459*** | 0.011*** | 0.012 |
| Robust SE | (0.326) | (4.711) | (0.003) | (0.014) |
| Conley SE | | [3.992] | | [0.014] |
| Mean of Dep. Var. | 8.004 | 8.004 | 0.0947% | 0.0947% |
| Std. Dev. of Dep. Var. | 8.380 | 8.380 | 0.366% | 0.366% |
| Observations | 2,577 | 2,577 | 2,934 | 2,934 |
| **Panel B: First Stage** | Dependent Variable: *Avg. Immigrant Share* | | | |
| Lag Rail Access | | 4.559*** | | 4.587*** |
| x Lag Immigration Inflow | | (0.858) | | (0.868) |
| Kleibergen Paap F-statistic | | 28.20 | | 27.90 |
| Controls (in all panels) | | | | |
| Industrialization Predicted Immigration | Yes | Yes | Yes | Yes |
| Business Cycle Predicted Immigration | Yes | Yes | Yes | Yes |
| Total Time Connected to Rail (as of 2000) | Yes | Yes | Yes | Yes |
| Polynomial for Latitude and Longitude | Yes | Yes | Yes | Yes |
| State Fixed Effects | Yes | Yes | Yes | Yes |

Note: This table shows the long-term effects of immigration on arts businesses. Arts businesses in County Business Patterns (CBP) data are defined by the first 3-digit of North American Industry Classification System (NAICS). In particular, most businesses with 3-digit NAICS 711 and 712 are included, see Table A.3 for the exact list of art businesses included. Columns (1) and (2) in panel A report OLS and 2SLS estimates using the logarithm number of arts business as the dependent variable. Columns (3) and (4) in panel A report OLS and 2SLS estimates using share of employee as the dependent variable. The variable "*Average Immigrant Share*" is the average share of a county's population that is foreign-born between 1860-1920. Columns (2) and (4) in panel B report the first stage estimates. All regressions control for the immigrant share predicted by industrialization, immigrant share predicted by business cycles, duration of connection to the railway network, polynomials for latitude and longitude, and state fixed effects. Robust standard errors are reported in parentheses and Conley standard errors that use a five-degree window are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Long-run effects of immigration on arts nonprofits

| | (1) OLS | (2) 2SLS | (3) OLS | (4) 2SLS |
|---|---|---|---|---|
| | Dependent Variable: | | | |
| | *Log No. of Arts Nonprofits* | | *Log. Avg. Revenue* | |
| *Avg. Immigrant Share* | 5.118*** | 18.299*** | 3.622*** | 3.421 |
| Robust SE | (0.598) | (6.419) | (0.529) | (5.813) |
| Conley SE | | [6.312] | | [6.262] |
| Observations | 2,925 | 2,925 | 2,599 | 2,599 |
| Mean of Dep. Var. | 7.990 | 7.990 | 25,006 | 25,006 |
| Std. Dev. of Dep. Var. | 35.17 | 35.17 | 107,695 | 107,695 |
| Controls (in all panels) | Yes | Yes | Yes | Yes |

Note: This table shows the long-term effects of immigration on arts nonprofits. First stage results are identical to those described in Table 2 and therefore are not repeated. Columns (1) and (2) report OLS and 2SLS estimates using the logarithm number of arts nonprofit organizations as the dependent variable. Columns (3) and (4) report OLS and 2SLS estimates using the logarithm average revenue as the dependent variable. The variable "*Average Immigrant Share*" is the average share of a county's population that is foreign-born between 1860-1920. All regressions control for the immigrant share predicted by industrialization, immigrant share predicted by business cycles, duration of connection to the railway network, polynomials for latitude and longitude, and state fixed effects. Robust standard errors are reported in parentheses and Conley standard errors that use a five-degree window are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Long-run effects of immigration on arts grants

| | (1) OLS | (2) 2SLS | (3) OLS | (4) 2SLS |
|---|---|---|---|---|
| | Dependent Variable: | | | |
| | *Log No. of Grants* | | *Log Avg. Grant Amount* | |
| *Avg. Immigrant Share* | 6.381*** | 25.158** | 7.435*** | 26.625** |
| Robust SE | (0.903) | (10.117) | (1.094) | (12.589) |
| Conley SE | | [10.343] | | [14.743] |
| Mean of Dep. Var. | 35.45 | 35.45 | 1.69M | 1.69M |
| Std. Dev. of Dep. Var. | 250.4 | 250.4 | 10M | 10M |
| Observations | 1,353 | 1,353 | 1,353 | 1,353 |
| Controls (in all panels) | Yes | Yes | Yes | Yes |

Note: This table shows the long-term effects of immigration on arts grants. First stage results are identical to those described in Table 2 and therefore are not repeated. Columns (1) and (2) report OLS and 2SLS estimates using the logarithm number of NEA arts grants as the dependent variable. Columns (3) and (4) report OLS and 2SLS estimates using the logarithm number of average annual arts grant value as the dependent variable. The variable "*Average Immigrant Share*" is the average share of a county's population that is foreign-born between 1860-1920. All regressions control for the immigrant share predicted by industrialization, the immigrant share predicted by business cycles, duration of connection to the railway network, polynomials for latitude and longitude, and state fixed effects. Robust standard errors are reported in parentheses and Conley standard errors that use a five-degree window are reported in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Effects of migrant artists vs. migrant non-artists on natives in arts occupations

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | *Migrant Artists* | | *Migrant Non − artists* | |
| | OLS | 2SLS: Lag Rail Access x Lag Immigration Inflow | OLS | 2SLS: Lag Rail Access x Lag Immigration Inflow |
| **Panel A: OLS and 2SLS** | Dependent variable: *Native Artist Share* | | | |
| *Immigrant Share* | 0.032 | 0.539* | -0.001 | 0.047** |
| | (0.077) | (0.301) | (0.002) | (0.021) |
| Observations | 12,353 | 12,353 | 12,353 | 12,353 |
| Mean of Dep. | 0.17% | 0.17% | 0.17% | 0.17% |
| Std.Dev. of Dep. | 0.53% | 0.53% | 0.53% | 0.53% |
| **Panel B: First Stage** | Dependent variable: | | | |
| | *Migrant Artist Share* | | *Migrant Non − artist Share* | |
| Lag Rail Access | | 0.023* | | 0.358*** |
| x Lag Immigration Inflow | | (0.013) | | (0.103) |
| Kleibergen Paap F-statistic | | 3.19 | | 12.06 |
| Controls (in all panels) | Yes | Yes | Yes | Yes |

Note: This table shows the effects of migrant artists and migrant non-artists separately on natives working in arts occupations. Columns (1) and (3) in panel A report the OLS estimate. Columns (2) and (4) in panel A report the 2SLS estimates. The variable "*Native Artist Share*" is the share of a county's population that is working in an arts-related occupation in period $t$. Column (2) and (4) in panel B reports the first stage estimates. All regressions control for variables listed in Table 1. The p-value for the test of differences between coefficients in columns (2) and (4) is 0.2582, suggesting no statistically significant difference between the two estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Short-run effects of immigration on natives working in arts occupations: stayers vs internal migrant

| | (1) OLS | (2) 2SLS: Lag Rail Access x Lag Immigration Inflow | (3) OLS | (4) 2SLS: Lag Rail Access x Lag Immigration Inflow |
|---|---|---|---|---|
| Dependent Variable: | *Native Stayer Artist Share* | | *Native Migrant Artist Share* | |
| *Immigrant Share* | -0.004** | 0.072*** | -0.002 | -0.006 |
| | (0.002) | (0.027) | (0.002) | (0.023) |
| Mean of Dep. Var. | 0.0985% | 0.0985% | 0.0736% | 0.0736% |
| Std. Dev. of Dep. Var. | 0.381% | 0.381% | 0.350% | 0.350% |
| Observations | 12,353 | 12,353 | 12,353 | 12,353 |
| Controls (in all panels) | Yes | Yes | Yes | Yes |

Note: This table shows the short-run effects of immigration on the share of the native population working in arts-related jobs, separately for the native population born in the same state ("stayers"), and for the native population born in another state ("internal"). Column (1) and (3) report the OLS estimates and columns (2) and (4) report 2SLS estimates. The variable "*Native Artist Share*" is defined as the number of native "stayers" as a share of local natives (columns (1) and (2)) or the number of native "internal migrants" as a share of non-local natives (columns (3) and (4)). The variable "*Immigrant Share*" is the share of a county's population that is foreign-born in period $t$. The set of control variables and the first stage results are exactly the same as in Table 1 and thus omitted from this table. *** p<0.01, ** p<0.05, * p<0.1

Table 7: 2nd-generation vs. non-2nd-generation effects on natives working in the arts

| | (1) 2SLS: Lag Rail Access x Lag Immigration Inflow | (2) 2SLS: Lag Rail Access x Lag Immigration Inflow |
|---|---|---|
| Dependent Variable: | $2nd-generation$ *Native Artist Share* | $Non\ 2nd-generation$ *Native Artist Share* |
| *Immigrant Share* | -0.012 | 0.087** |
| | (0.014) | (0.042) |
| Mean of Dep. Var. | 0.04% | 0.13% |
| Std. Dev. of Dep. Var. | 0.23% | 0.48% |
| Observations | 12,353 | 12,353 |
| Controls | Yes | Yes |

Note: This table reports 2SLS estimates of the heterogeneous effects of immigration on native artists on two populations, 2nd-generation immigrants and non-native populations that are not 2nd-generation immigrants. 2nd-generation immigrants are defined as individuals whose mother or father was born outside of the United States. The variable in column (1) "$2nd-generation$ *Artist Share*" is the share of a county's population that is a 2nd-generation immigrant and working in an arts-related occupation. The variable in column (2) "$Non\ 2nd-generation$ *Native Artist Share*" is the share of a county's population that is not a 2nd-generation immigrant and working in an arts-related occupation. All regressions control for variables listed in Table 1. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Country-specific effects

| | (1) 2SLS | (2) 2SLS | (3) 2SLS |
|---|---|---|---|
| **Panel A: 2SLS** | Dependent Variable: | | |
| | *Sculptor & Architect Share* | *Musician Share* | *Authors Share* |
| *French Immig* | 0.030*** | | |
| | (0.011) | | |
| $Non - French\ Immig$ | 0.001 | | |
| | (0.002) | | |
| *Austrian & German Immig* | | 0.615* | |
| | | (0.319) | |
| $Non - Austrian\ \&$ *German Immig* | | -0.102 | |
| | | (0.070) | |
| *British Immig* | | | 0.070 |
| | | | (0.087) |
| $Non - British\ Immig$ | | | -0.003 |
| | | | (0.004) |
| Mean of Dep. Var. | 0.0073% | 0.103% | 0.002% |
| Std. Dev. of Dep. Var. | 0.072% | 0.044% | 0.046% |
| Observations | 12,353 | 12,353 | 12,353 |
| **Panel B: First Stage** | Dependent Variable: | | |
| | *French* | *Austrian & German* | *British* |
| Lag Rail Access x Lag Immigration Inflow (Specific country) | 0.368*** | 0.698 | 0.173** |
| | (0.089) | (0.835) | (0.084) |
| Lag Rail Access x Lag Immigration Inflow (Exclude specific country) | -0.072* | 0.004 | 0.218 |
| | (0.041) | (0.030) | (0.217) |
| F-statistic | 10.84 | 3.28 | 6.17 |
| **Panel C: First Stage** | Dependent Variable: | | |
| | *Non French* | *Non Austrian & German* | $Non - British$ |
| Lag Rail Access x Lag Immigration Inflow (Exclude specific country) | 0.478*** | 0.116* | 0.342*** |
| | (0.123) | (0.062) | (0.115) |
| Lag Rail Access x Lag Immigration Inflow (Specific country) | -0.798*** | 0.752*** | 0.253** |
| | (0.233) | (0.193) | (0.064) |
| F-statistic | 14.52 | 14.53 | 13.79 |
| Controls (in all panels) | Yes | Yes | Yes |

Note: This table shows the short-run country specific effects of immigration. Columns (1), (2), and (3) in panel A report 2SLS estimates using the share of sculptors and architects, the share of musicians, and the share of writers and authors over total county population as the dependent variables, respectively. Panel B reports the first stage estimates using French immigrant share, German & Austrian immigrant share, and the British immigrant share as the dependent variables. Panel C reports the first stage estimates using Non-French immigrant share, Non-German & Austrian immigrant share, and Non-British as the dependent variables. *** p<0.01, ** p<0.05, * p<0.1

Table 9: Long-run effects of immigration on arts: direct effect vs indirect income effect

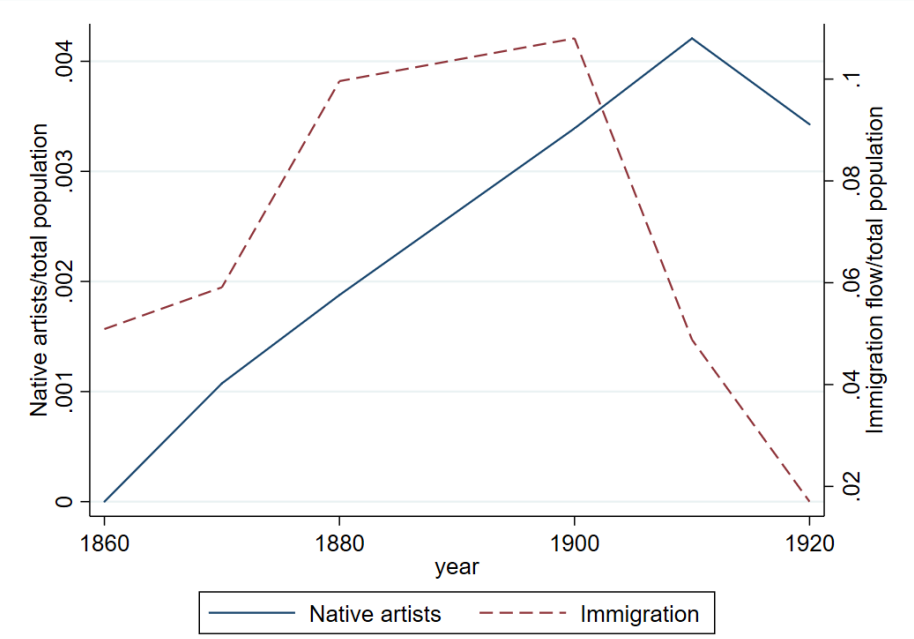
| | (1) 2SLS | (2) 2SLS | (3) 2SLS | (4) 2SLS | (5) 2SLS | (6) 2SLS |
|---|---|---|---|---|---|---|
| Dependent Variable | Art business | Employee share | Art nonprofits | Revenue | Art Grants | Grant Amount |
| *Total Effect* | 140.897*** | 0.012 | 251.526* | 3.421 | 25.158** | 26.625** |
| | (36.670) | (0.014) | (92.984) | (5.813) | (10.117) | (12.589) |
| *Direct Effect* | 28.886*** | 0.011*** | 131.805*** | 3.612*** | 7.390*** | 8.467*** |
| | (3.557) | (0.003) | (47.108) | (0.591) | (1.039) | (1.269) |
| *Indirect Effect* | 112.011** | 0.001 | 119.722 | -0.191 | 17.768 | 18.158 |
| | (43.912) | (0.013) | (79.265) | (5.525) | (12.021) | (14.125) |
| **Direct Effect Share** | **21%** | **91%** | **53%** | **105%** | **30%** | **32%** |
| Mean of Dep. Var. | 8.681 | 0.27% | 7.990 | 25.006 | 35.45 | 1.69M |
| Std. Dev. of Dep. Var. | 9.402 | 0.55% | 35.17 | 107,695 | 250.4 | 10M |
| Observations | 2,935 | 2,934 | 2,925 | 2,599 | 1,353 | 1,353 |
| Controls (in all panels) | Yes | Yes | Yes | Yes | Yes | Yes |

Note: This table shows results from the causal mediation analysis of the long-term effects of immigration on arts, using county level median income in 1980 (deflated to 2000) as the mediator. Columns report 2SLS estimates on arts businesses, employee share, arts nonprofits, log revenue, log arts grants, and log arts grant amount respectively. The variable "*Total*" is the total effect of average historical immigration share on the long-run arts outcome noted for that column. The variable "*Direct*" is the direct effect of average historical immigration share on the long-run arts outcome noted for that column. The variable "*Indirect*" is the indirect effect of average immigration share on the long-run arts outcome noted for that column, mediated through income. *** p<0.01, ** p<0.05, * p<0.1

Table 10: Testing for mechanical short-term effects of immigration on the economy: scaling by population in labor force and employed persons

| | (1) OLS | (2) 2SLS: Lag Rail Access x Lag Immigration Inflow | (3) OLS | (4) 2SLS: Lag Rail Access x Lag Immigration Inflow |
|---|---|---|---|---|
| | Dependent Variable: *Native Artist Share* | | | |
| *Immigrant Share* | -0.005* | 0.103* | -0.004* | 0.109** |
| | (0.003) | (0.002) | (0.054) | (0.051) |
| Mean of Dep. Var. | 0.27% | 0.27% | 0.27% | 0.27% |
| Std. Dev. of Dep. Var. | 0.84% | 0.84% | 0.84% | 0.84% |
| Observations | 12,353 | 12,353 | 12,353 | 12,353 |
| Controls (in all panels) | Yes | Yes | Yes | Yes |

Note: This table shows the short-run effects of immigration on the number of natives in arts-related jobs, reported as a share of the population in the labor force or who have non-missing occupation codes. Column (1) and (3) report the OLS estimates and columns (2) and (4) report 2SLS estimates. The variable "*Native Artist Share*" either uses a county's population that is in the labor force as the denominator (columns (1) and (2)) or who have non-missing occupation codes (columns (3) and (4)). The variable "*Immigrant Share*" is the share of a county's population that is foreign-born in period $t$. The set of control variables and the first stage results are exactly the same as in Table 1 and thus are omitted from this table. *** p<0.01, ** p<0.05, * p<0.1




Note: The red dotted line shows immigration inflows as a share of the total U.S. population during the Age of Mass Migration. The blue solid line shows the share of native artists as a share of the total U.S. population. Data is drawn from the IPUMS USA Census 1% sample in 1860, 1870, 1880, 1900, 1910, and 1920.

Figure 1: Immigrant & Native Artist Shares during the Age of Mass Migration

# Online Appendix A: Additional Tables and Figures

Table A.1: List of artist occupations

| |
|---|
| Architects* |
| Designers* |
| Draftsmen* |
| Apprentices of Architects, Designers, & Draftsmen* |
| Actors |
| Showmen |
| Artists |
| Sculptors |
| Teachers of art |
| Authors |
| Musicians |
| Music teachers |
| Photographers |

Note: This table provides a list of occupations included in our primary artist definition. Artist occupation descriptions are from the Census descriptions for respective occupation codes. In robustness checks, we drop categories with * from our analysis and the main results hold.

Table A.2: Short-run effects of immigration on natives working in arts occupations: alternative artist definition from Borowiecki and Graddy (2021)

| | (1) OLS | (2) 2SLS: Lag Rail Access x Lag Immigration Inflow |
|---|---|---|
| **Panel A: OLS and 2SLS** | Dependent Variable: *Native Artist Share* | |
| *Immigrant Share* | -0.004* | 0.069** |
| Cluster SE | (0.002) | (0.031) |
| Mean of Dep. Var. | 0.14% | 0.14% |
| Std. Dev. of Dep. Var. | 0.48% | 0.48% |
| Observations | 12,353 | 12,353 |
| **Panel B: First Stage** | Dependent Variable: *Immigrant Share* | |
| Lag Rail Access | | 0.223*** |
| x Lag Immigration Inflow | | (0.045) |
| Kleibergen Paap F-statistic | | 23.63 |
| Controls (in all panels) | | |
| Lag Rail Access | Yes | Yes |
| Lag Immigration Share | Yes | Yes |
| Lag Urbanization Dummy | Yes | Yes |
| Log County Population Density | Yes | Yes |
| Lag Urbanization Dummy | Yes | Yes |
| x Lag Immigration Inflow Share | | |
| Lag Rail Access | Yes | Yes |
| x Lag GDP Growth | | |
| Lag Rail Access | Yes | Yes |
| x Lag Log Industrialization Index | | |
| Log County Population Density | Yes | Yes |
| County Fixed Effects | Yes | Yes |
| Year Fixed Effects | Yes | Yes |

Note: This table replicates Table 1 in the main text but using artist occupations as used from Borowiecki and Graddy (2021), which includes: artists, authors, musicians, actors, architects, and journalists. *** p<0.01, ** p<0.05, * p<0.1

Table A.3: List of NAICS of Art Establishments

| NAICS Code | Art Business |
|---|---|
| 711 | Performing arts, spectator sports, & related industries |
| 7111 | Performing arts companies |
| 71111 | Theater companies & dinner theaters |
| 711110 | Theater companies & dinner theaters |
| 71112 | Dance companies |
| 711120 | Dance companies |
| 71113 | Musical groups & artists |
| 711130 | Musical groups & artists |
| 71119 | Other performing arts companies |
| 711190 | Other performing arts companies |
| 7112 | Spectator sports |
| 71121 | Spectator sports |
| 711211 | Sports teams and clubs |
| 711212 | Racetracks |
| 711219 | Other spectator sports |
| 7113 | Promoters of entertainment events |
| 71131 | Promoters of entertainment events with facility |
| 711310 | Promoters of entertainment events with facility |
| 71132 | Promoters of entertainment events without facility |
| 711320 | Promoters of entertainment events without facility |
| 7114 | Agents, managers for artists & other public figures |
| 71141 | Agents, managers for artists & other public figures |
| 711410 | Agents, managers for artists & other public figures |
| 7115 | Independent artists, writers & performers |
| 71151 | Independent artists, writers & performers |
| 711510 | Independent artists, writers & performers |
| 712 | Museums, historical sites & like institutions |
| 7121 | Museums, historical sites & like institutions |
| 71211 | Museums |
| 712110 | Museums |
| 71212 | Historical sites |
| 712120 | Historical sites |

Note: This table provides a list of NAICS of Art Establishments included in our art business. Data are from County Business Patterns (2000, 2005, 2010, 2015, and 2020).

Table A.4: Pre-trend placebo test

| Dependent Variable | (1)<br>Predicted Average Immigrant Share |
|---|---|
| Panel A. Sample of counties that were unconnected as of 1890 | |
| Share of native artists, 1860-1890 | -0.0634 |
| p-value | (0.21) |
| No. of Obs. | 58 |
| Panel B. Sample of counties that were unconnected as of 1880 | |
| Share of native artists, 1860-1880 | 0.040 |
| p-value | (0.51) |
| No. of Obs. | 267 |
| Panel C. Sample of counties that were unconnected as of 1870 | |
| Share of native artists, 1860-1870 | 0.018 |
| p-value | (0.621) |
| No. of Obs. | 751 |

Note: This table reports correlation coefficients of the relationship between the average predicted immigrant share between 1890-1920 and share of native artists during a "pre-period" prior to all counties in the sample being connected to the railway.

Table A.5: Short-run effects of immigration on natives working in arts occupations: results with state-by-year fixed effects

| | (1) OLS | (2) 2SLS: Lag Rail Access x Lag Immigration Inflow | (3) 2SLS: Lag Rail Access x Lag Immigration Inflow |
|---|---|---|---|
| **Panel A: OLS and 2SLS** | Dependent Variable: *Native Artist Share* | | |
| *Immigrant Share* | -0.003 | 0.076** | 0.107** |
| Cluster SE | (0.002) | (0.033) | (0.051) |
| Conley SE | | [0.003] | [0.008] |
| Mean of Dep. Var. | 0.17% | 0.17% | 0.17% |
| Std. Dev. of Dep. Var. | 0.53% | 0.53% | 0.53% |
| Observations | 12,353 | 12,353 | 12,353 |
| **Panel B: First Stage** | Dependent Variable: *Immigrant Share* | | |
| Lag Rail Access | | 0.223*** | 0.143*** |
| x Lag Immigration Inflow | | (0.045) | (0.042) |
| Kleibergen Paap F-statistic | | 23.63 | 12.00 |
| Controls (in all panels) | | | |
| Lag Rail Access | Yes | Yes | Yes |
| Lag Immigration Share | Yes | Yes | Yes |
| Lag Urbanization Dummy | Yes | Yes | Yes |
| Log County Population Density | Yes | Yes | Yes |
| Lag Urbanization Dummy | Yes | Yes | Yes |
| x Lag Immigration Inflow Share | | | |
| Lag Rail Access | Yes | Yes | Yes |
| x Lag GDP Growth | | | |
| Lag Rail Access | Yes | Yes | Yes |
| x Lag Log Industrialization Index | | | |
| Log County Population Density | Yes | Yes | Yes |
| County Fixed Effects | Yes | Yes | Yes |
| Year Fixed Effects | Yes | Yes | Yes |
| State by Year Fixed Effects | No | No | Yes |

Note: This table shows the short-run effects of immigration on the share of the native population working in arts-related jobs. Column (1) in panel A reports the OLS estimate. Columns (2) in panel A reports 2SLS estimate. The variable "*Native Artist Share*" is the share of a county's population that is working in an arts-related occupation in period $t$. The variable "*Immigrant Share*" is the share of a county's population that is foreign-born in period $t$. Column (2) in panel B reports the first stage estimate. Standard errors clustered at the county level are reported in parentheses and Conley standard errors that use a five-degree window are reported in brackets. Column (3) further includes state-by-year fixed effect. *** p<0.01, ** p<0.05, * p<0.1

Table A.6: Bartik instrument, short-run effects of immigration on natives working in arts occupations

| | (1) OLS | (2) 2SLS: Shift-share |
|---|---|---|
| **Panel A: OLS and 2SLS** | Dependent Variable: *Native Artist Share* | |
| *Immigrant Share* | -0.003 | 0.052*** |
| | (0.002) | (0.014) |
| Mean of Dep. Var. | 0.17% | 0.19% |
| Std. Dev. of Dep. Var. | 0.53% | 0.52% |
| Observations | 12,353 | 9,752 |
| **Panel B: First Stage** | Dependent Variable: *Immigrant Share* | |
| Shift-share | | 0.010*** |
| | | (0.003) |
| Kleibergen Paap F-statistic | | 9.11 |
| Controls (in all panels) | Yes | Yes |
| County Fixed Effects | Yes | Yes |
| Year Fixed Effects | Yes | Yes |

Note: This table shows the short-run effects of immigration on the share of the native population working in arts-related jobs. Column (1) in panel A reports the OLS estimate. Columns (2) in panel A reports 2SLS estimates using the shift-share instruments. The variable "*Native Artist Share*" is the share of a county's population that is working in an arts-related occupation in period $t$. The variable "*Immigrant Share*" is the share of a county's population that is foreign-born in period $t$. Column (2) in panel B reports the first stage estimates. Note that the observations using shift-share is smaller because we take the first period in our data (1960) to calculate the share, thus they are not being used in the main analysis. *** p<0.01, ** p<0.05, * p<0.1

Table A.7: Lagged model: Short-run effects of immigration on natives working in arts occupations

| | (1) OLS | (2) 2SLS: Lag Rail Access x Lag Immigration Inflow |
|---|---|---|
| | Dependent Variable: *Native Artist Share* | |
| *Immigrant Share* | -0.002 | 0.159** |
| Cluster SE | (0.001) | (0.076) |
| Mean of Dep. Var. | 0.19% | 0.19% |
| Std. Dev. of Dep. Var. | 0.52% | 0.52% |
| Observations | 9,752 | 9,752 |
| Controls | Yes | Yes |

Note: This table replicates the main short-run analysis in the paper using lagged immigration in a county as the independent variable. The sample size is smaller because when we specified a lag model, the first period observations drop. *** p<0.01, ** p<0.05, * p<0.1

Table A.8: Alternative long-run specifications: dropping large counties, constant county border

| | (1) 2SLS | (2) 2SLS | (3) 2SLS | (4) 2SLS | (5) 2SLS | (6) 2SLS |
|---|---|---|---|---|---|---|
| Dependent Variable | Art business | Employee share | Art nonprofits | Revenue | Art Grants | Grant Amount |
| | | | Panel A: Drop NY and LA | | | |
| *Avg. Immigrant Share* | 144.736*** | 0.021 | 202.340*** | 3.334 | 24.801** | 26.202** |
| | (39.183) | (0.020) | (77.628) | (5.855) | (10.150) | (12.677) |
| Mean of Dep. Var. | 8.664 | 0.0513% | 7.356 | 24,811 | 28.52 | 1.454M |
| Std. Dev. of Dep. Var. | 9.380 | 0.233% | 23.79 | 107,307 | 128.4 | 6.425M |
| Observations | 2,932 | 2,931 | 2,923 | 2,597 | 1,351 | 1,351 |
| | | | Panel B: Drop 5 largest counties | | | |
| *Avg. Immigrant Share* | 142.808*** | 0.039 | 226.411*** | 3.307 | 24.141** | 25.497** |
| | (38.478) | (0.027) | (83.921) | (5.779) | (9.735) | (12.228) |
| Mean of Dep. Var. | 8.658 | 0.0534% | 7.612 | 24,973 | 33.53 | 1.630M |
| Std. Dev. of Dep. Var. | 9.374 | 0.269% | 31.68 | 107,761 | 243.9 | 9.896M |
| Observations | 2,929 | 2,928 | 2,920 | 2,594 | 1,348 | 1,348 |
| | | | Panel C: Constant county border | | | |
| *Avg. Immigrant Share* | 151.565*** | 0.001 | 284.660 | 7.050 | 26.953 | 13.961 |
| | (57.636) | (0.058) | (225.657) | (6.788) | (20.597) | (27.697) |
| Mean of Dep. Var. | 8.681 | 0.0543% | 7.990 | 25,006 | 35.45 | 1.694M |
| Std. Dev. of Dep. Var. | 9.402 | 0.271% | 35.17 | 107,695 | 250.4 | 10M |
| Observations | 1,488 | 1,488 | 1,484 | 1,319 | 652 | 652 |
| Controls (in all panels) | Yes | Yes | Yes | Yes | Yes | Yes |

Note: This table shows several alternative specifications for the long-run estimates. Panel A shows the long-run estimates after dropping counties containing New York City and Los Angeles. Panel B shows the long-run estimates after dropping the five largest counties in the U.S. Panel C restricts the sample to counties with constant borders over time. *** p<0.01, ** p<0.05, * p<0.1

Table A.9: Short-run heterogeneous effects of immigration on natives working in arts occupations

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | 2SLS: Lag Rail Access x Lag Immigration Inflow | | | |
| Dependent Variable: | *Visual art artists* | *Actors* | *Musicians* | *Authors* |
| *Immigrant Share* | 0.014 | 0.024** | 0.033 | 0.002 |
| | (0.019) | (0.011) | (0.034) | (0.004) |
| Controls | Yes | Yes | Yes | Yes |
| Mean of Dep. Var. | 0.05% | 0.02% | 0.09% | 0.01% |
| Std.Dev. of Dep. Var. | 0.3% | 0.2% | 0.4% | 0.05% |
| Observations | 12,330 | 12,330 | 12,330 | 12,330 |

Note: This table reports 2SLS estimates of the short-run heterogeneous effects of immigration on the share of the native population working in arts-related jobs, by arts sub-fields. The visual arts sub-field includes architects, draftsman, artist, sculptors, teachers of art, photographers, and designers (and apprentices for those occupations). *** p<0.01, ** p<0.05, * p<0.1

Table A.10: Long-run heterogeneous effects of immigration on arts grants

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | 2SLS: Lag Rail Access x Lag Immigration Inflow | | | | | |
| Dependent Variable: | *Dance* | *Music* | *Visual arts* | *Literary* | *Exhibits* | *Arts promotion* |
| *Avg. Immigrant Share* | 5.937** | 7.648*** | 8.579*** | 8.191*** | 7.518*** | 7.160*** |
| | (2.859) | (2.894) | (2.799) | (2.836) | (2.905) | (2.053) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Mean of Dep. Var. | 0.239 | 0.255 | 0.336 | 0.254 | 0.289 | 0.172 |
| Std.Dev. of Dep. Var. | 0.846 | 0.778 | 0.789 | 0.735 | 0.773 | 0.608 |
| Observations | 2,934 | 2,934 | 2,934 | 2,934 | 2,934 | 2,934 |

Note: This table reports 2SLS estimates of the heterogeneous effects of immigration on the log number of NEA arts grants by arts sub-fields. *Dance* includes grants pertaining to dance and theater, *Music* includes the grant categories of musical theater, opera, and music; *Visual arts* includes grants for design, folk & traditional arts, and visual arts; *Literary* includes the grant categories of literary arts and media arts; *Exhibits* includes grants falling under the categories of museums, art communities, federal partnerships, international, state regional, and local arts agencies; *Arts promotion* including the categories of arts education, program innovation, arts engagement, research, accessibility, and presenting multidisciplinary. *** p<0.01, ** p<0.05, * p<0.1

Table A.11: Short-run geographic spillover effects of immigration on share working in art occupations

| | (1) OLS | (2) 2SLS: Lag Rail Access x Lag Immigration Inflow |
|---|---|---|
| | Dependent variable: *Native Artist Share* | |
| *Immigrant Share* | -0.005 | 0.075* |
| | (0.003) | (0.043) |
| *Avg. Adjacent Co. Immigrant Share* | 0.002 | 0.001 |
| | (0.003) | (0.003) |
| Mean of Dep. | 0.17% | 0.17% |
| Std. Dev. of Dep. | 0.53% | 0.53% |
| Observations | 12,330 | 7,760 |
| Controls (in all panels) | Yes | Yes |

Note: This table reports the short-term spillover effects of immigration on natives working in arts-related occupations. Column (1) reports the OLS estimate while column (2) reports 2SLS estimates. The variables "*Immigrant Share*" and "*Avg. Adjacent Co. Immigrant Share*" are the share of foreign-born individuals in a county and the average share in its adjacent counties, respectively. All regressions control for lag railway access, lag immigration share, lag urbanization dummy, log county population density, lag urbanization dummy × lag immigration flow share, the interaction between lag railway access and lag GDP growth, polynomials for latitude and longitude, as well as county and year fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Table A.12: Long-run geographic spillover effects of immigration on number of arts businesses and nonprofits

| | (1) OLS | (2) 2SLS | (3) OLS | (4) 2SLS |
|---|---|---|---|---|
| | Dependent variable: | | | |
| | *No. of Businesses* | | *No. of Arts Nonprofits* | |
| *Avg. Immigrant Share* | 31.386*** | 134.111*** | 6.259*** | 16.992** |
| | (4.235) | (46.408) | (0.807) | (8.139) |
| *Avg. Adjacent Immigrants Share* | -10.457* | 26.378 | -2.526** | 4.983 |
| | (5.891) | (54.968) | (0.106) | (10.949) |
| Mean of Dep. Var. | 8.681 | 8.681 | 231.5 | 231.5 |
| Std. Dev. of Dep. Var. | 9.402 | 9.402 | 1,020 | 1,020 |
| Observations | 2,934 | 2,934 | 2,621 | 2,621 |
| Controls (in all panels) | Yes | Yes | Yes | Yes |

Note: This table shows the long-term spillover effects of immigration on the presence of the arts in counties. Columns (1) and (2) report OLS and 2SLS estimates using the logarithm number of arts businesses as the dependent variable. Columns (3) and (4) reports OLS and 2SLS estimates using the logarithm number of arts nonnonprofits as the dependent variable. The variables "*Avg. Immigrant Share*" and "*Avg. Adjacent Immigrants Share*" are the average share that is foreign-born between 1860-1920 in a county and in its adjacent counties, respectively. All regressions control for the immigrant share predicted by industrialization, immigrant share predicted by business cycles, polynomials for latitude and longitude, and state fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Table A.13: Medium-term (1930-1940) effects of immigration on arts development

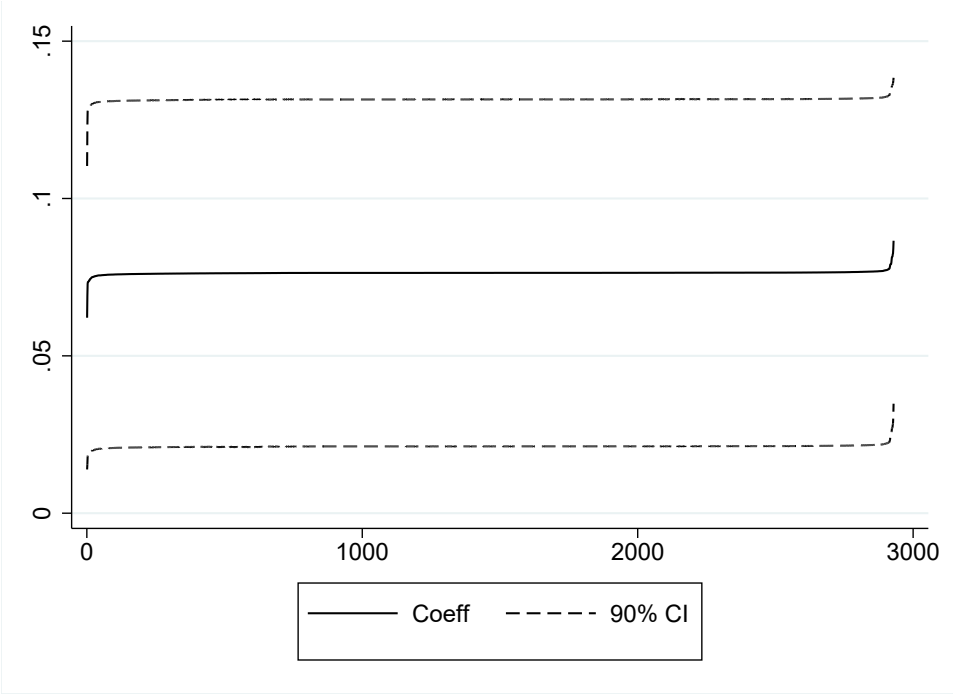
| | (1) | (2) |
|---|---|---|
| | 2SLS | 2SLS |
| Dependent Variable | *Native Artists Share* | *No. of Plays* |
| *Avg. Immigrant Share* | 0.014** | 3.126 |
| | (0.007) | (6.789) |
| Mean of Dep. Var. | 0.20% | 0.137 |
| Std. Dev. of Dep. Var. | 0.494% | 1.732 |
| Observations | 2,902 | 2,935 |
| Controls (in all panels) | Yes | Yes |

Note: This table reports the medium-term effects of immigration on the arts in America. We report 2SLS estimates using the native artist share (column (1)) and number of Federal Theatre Project plays (column (2)) as the dependent variables. All regressions control for the immigrant share predicted by industrialization, immigrant share predicted by business cycles, duration of connection to the railway network, polynomials for latitude and longitude, and state fixed effects. *** p<0.01, ** p<0.05, * p<0.1

Table A.14: Long-run effects of immigration on arts controlling for domestic migration

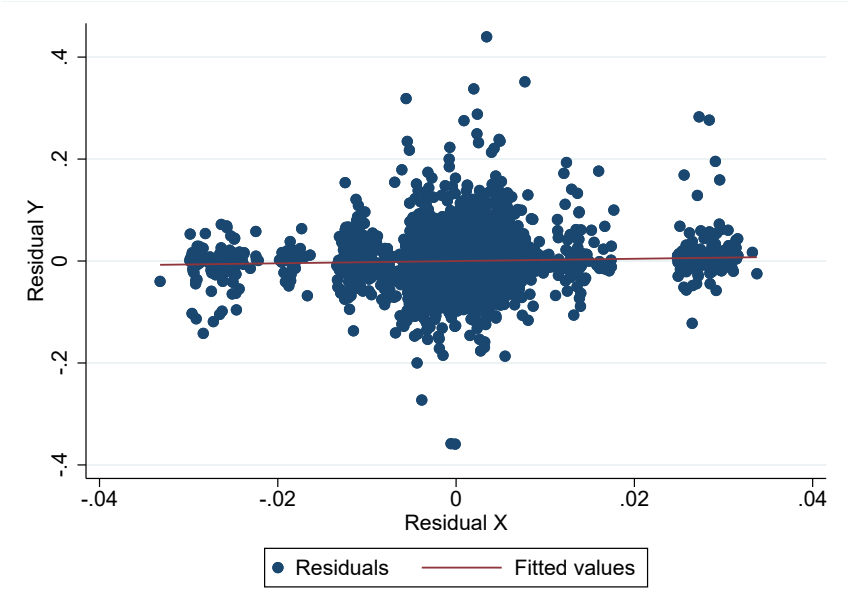
| | (1) OLS | (2) 2SLS | (3) OLS | (4) 2SLS |
|---|---|---|---|---|
| **Panel A: Art Businesses** | Dependent Variable: | | | |
| | *No. of Businesses* | | *Employee Share* | |
| *Avg. Immigrant Share* | 16.495*** | 165.230*** | 0.005** | 0.035 |
| | (3.213) | (40.956) | (0.002) | (0.030) |
| Mean of Dep. Var. | 8.681 | 8.681 | 0.27% | 0.27% |
| Std. Dev. of Dep. Var. | 9.402 | 9.402 | 0.55% | 0.55% |
| Observations | 2,934 | 2,934 | 2,933 | 2,933 |
| **Panel B: Art Nonprofits** | Dependent Variable: | | | |
| | *No. of Arts Nonprofits* | | *Log. Revenue* | |
| *Avg. Immigrant Share* | 75.127** | 257.551*** | 2.602*** | 5.026 |
| | (38.222) | (90.834) | (0.533) | (5.453) |
| Observations | 2,925 | 2,925 | 2,599 | 2,599 |
| Mean of Dep. Var. | 7.990 | 7.990 | 25,006 | 25,006 |
| Std. Dev. of Dep. Var. | 35.17 | 35.17 | 107,695 | 107,695 |
| **Panel C: Art Grants** | Dependent Variable: | | | |
| | *Log. No. of Grants* | | *Log. Avg. Grant Amount* | |
| *Avg. Immigrant Share* | 3.190*** | 28.868*** | 3.733*** | 30.432*** |
| | (0.755) | (9.561) | (0.942) | (11.473) |
| Mean of Dep. Var. | 35.45 | 35.45 | 1.69M | 1.69M |
| Std. Dev. of Dep. Var. | 250.4 | 250.4 | 10M | 10M |
| Observations | 1,353 | 1,353 | 1,353 | 1,353 |
| Controls (in all panels) | | | | |
| Industrialization Predicted Immigration | Yes | Yes | Yes | Yes |
| Business Cycle Predicted Immigration | Yes | Yes | Yes | Yes |
| Total Time Connected to Rail (as of 2000) | Yes | Yes | Yes | Yes |
| Polynomials for Latitude and Longitude | Yes | Yes | Yes | Yes |
| State Fixed Effects | Yes | Yes | Yes | Yes |
| $\Delta$ Share Black 1920-1970 | Yes | Yes | Yes | Yes |
| Immigrant Share in 2000 | Yes | Yes | Yes | Yes |

Note: This table shows the long-term effects of immigration on arts after controlling for domestic migration events. Panel A, B, and C report OLS and 2SLS estimates on art businesses, art nonprofits, and art grants respectively. The variable "*Avg. Immigrant Share*" is the average share of a county's population that is foreign-born between 1860-1920. *** p<0.01, ** p<0.05, * p<0.1



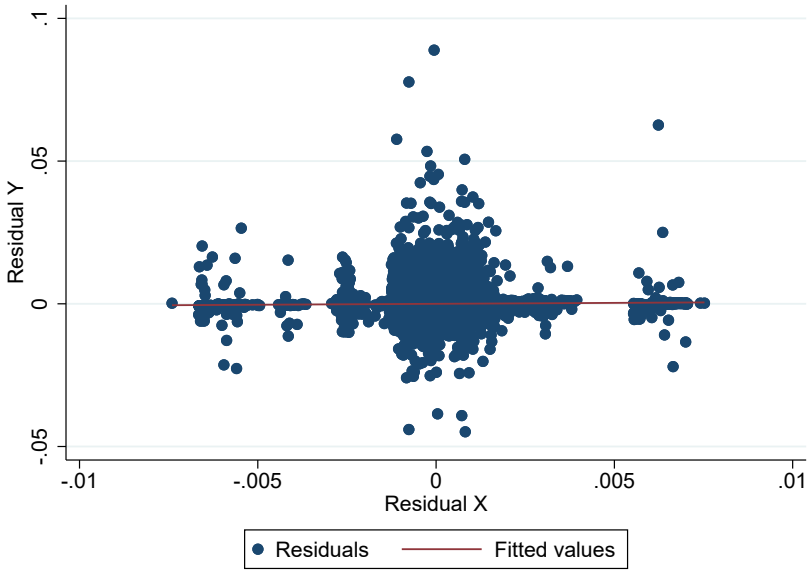

Note: This figure plots the coefficients and 90% confidence intervals (CI) by dropping one county a time. Coefficients and their CIs are organized from the lowest to the highest.

Figure A.1: Short-run effects on native artists, omitting one county at a time



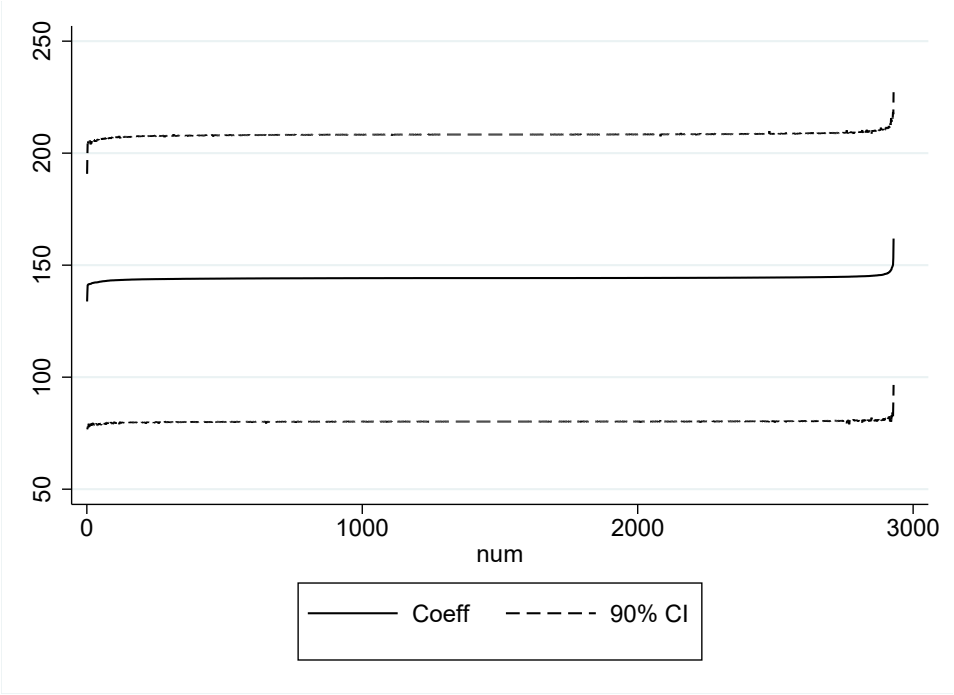

Note: This figure shows the scatter plots of the partial regression of the short-run first stage.

Figure A.2: Short-run first stage scatter plot of partial regression



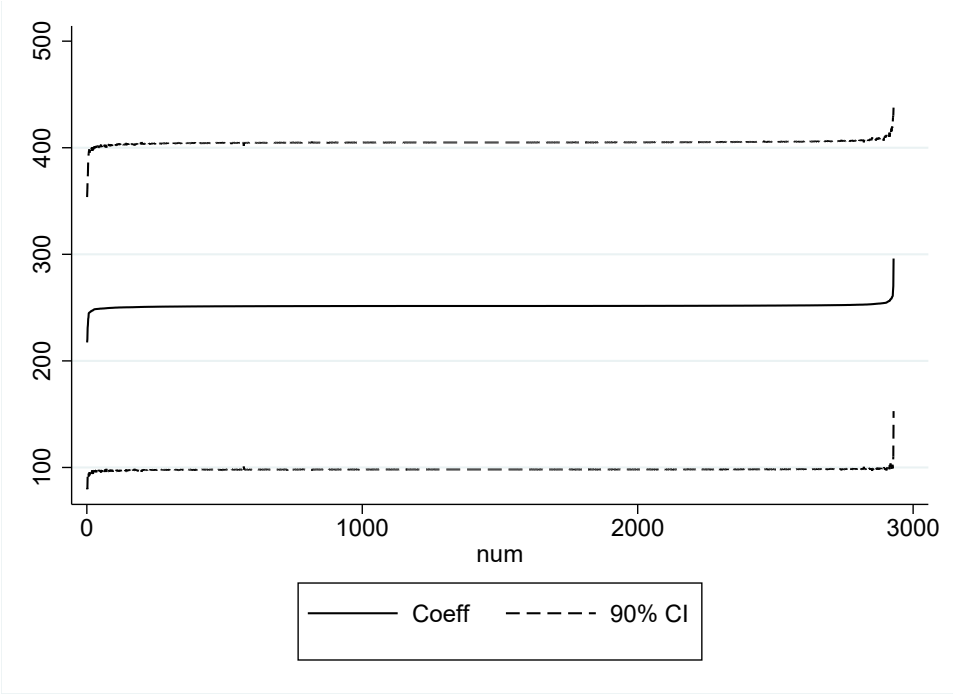

Note: This figure shows the scatter plots of the partial regression of the short-run second stage.

Figure A.3: Short-run second stage scatter plot of partial regression



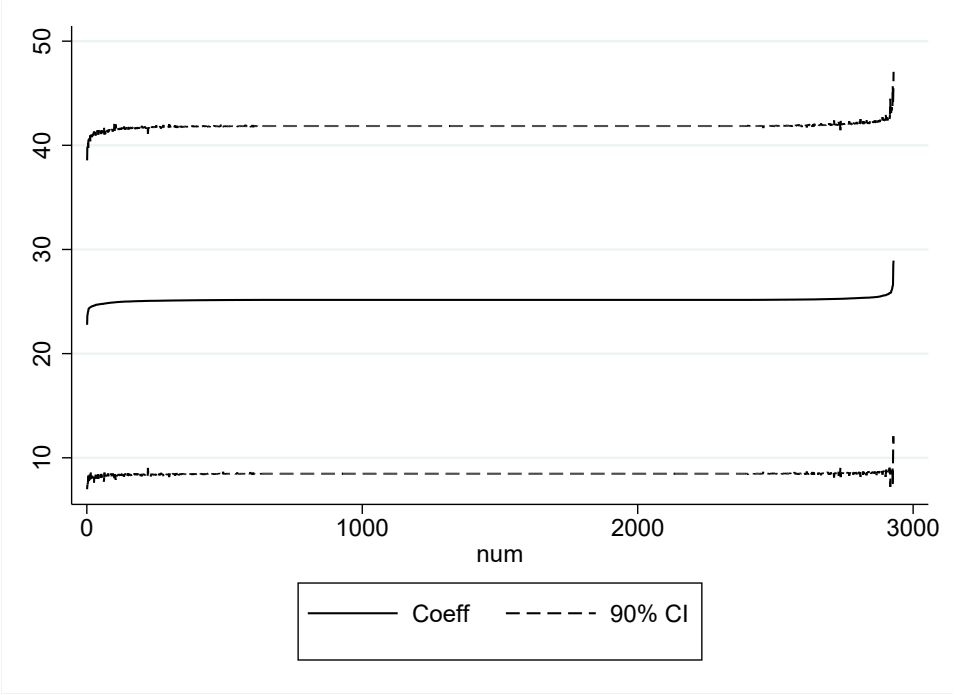

Note: This figure plots the coefficients and 90% confidence intervals (CI) by dropping one county a time. Coefficients and their CIs are organized from the lowest to the highest.

Figure A.4: Long-run effects on arts businesses, omitting one county at a time



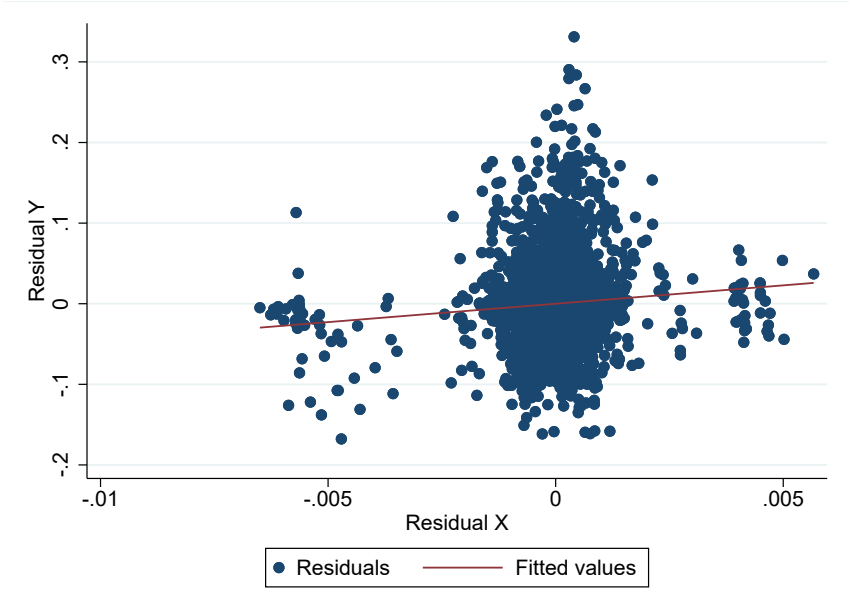

Note: This figure plots the coefficients and 90% confidence intervals (CI) by dropping one county a time. Coefficients and their CIs are organized from the lowest to the highest.

Figure A.5: Long-run effects on arts nonprofits, omitting one county at a time



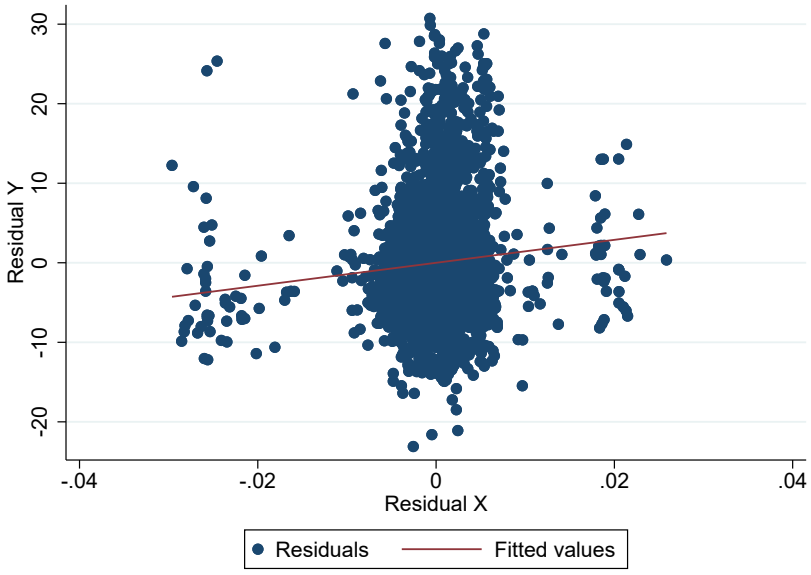

Note: This figure plots the coefficients and 90% confidence intervals (CI) by dropping one county a time. Coefficients and their CIs are organized from the lowest to the highest.

Figure A.6: Long-run effects on number of NEA grants, omitting one county at a time




Note: This figure shows the scatter plots of the partial regression of the long-run first stage.

Figure A.7: Long-run first stage scatter plot of partial regression




Note: This figure shows the scatter plots of the partial regression of the long-run second stage on art establishments.

Figure A.8: Long-run second stage scatter plot of partial regression on art establishments