



# Cultural diversity and economic growth: Evidence from the US during the age of mass migration



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## ABSTRACT

We exploit the large inflow of immigrants to the US during the 1870–1920 period to examine the effects that within-county changes in the cultural composition of the US population had on output growth. We construct measures of fractionalization and polarization to distinguish between the different effects of cultural diversity. Our main finding is that increases in cultural fractionalization significantly increased output, while increases in cultural polarization significantly decreased output. We address the issue of identifying the causal effects of cultural diversity by using the supply–push component of immigrant inflows as an instrumental variable.

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## 1. Introduction

During the 1850–1920 period the US experienced a mass inflow of immigrants: more than 30 million people migrated from Europe to the US, with the average annual immigration inflow rate measuring about 0.75% of the total US population (Hatton and Williamson, 1998). We exploit this historically unique inflow of immigrants to the US to study the effects that changes in the cultural composition of the US population had on output growth. Because immigrants came from different European countries, the mass immigration wave not only affected the overall share of foreign-born in the US but also affected significantly the diversity of the working and voting-age population.<sup>1</sup>

A by now well-established literature has investigated the effects of cultural diversity on economic growth in the cross-section of countries.<sup>2</sup> Our aim is to contribute to this literature in two main dimensions. First, our empirical analysis is based on comparing how within-county changes in cultural diversity affect within-county changes in output. An often made critique of the cross-country growth literature is that in the cross-section there are many difficult-to-measure omitted variables, such as history and geography, that affect both economic growth and the cultural diversity of the population. Our empirical analysis circumvents this critique by using exclusively the within-county variation of the data. Fixed factors, such as geography or history are therefore differenced out. Second, as Alesina and La Ferrara (2005) point out, the cultural diversity of regions may itself respond over time to changes in the economic environment. We address this important issue

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<sup>1</sup> See for example, Cohn (2010), Hatton and Williamson (1998), or Kim (2007) and the references therein for further information on the history of immigration to the US.

<sup>2</sup> See for example, Mauro (1995), Easterly and Levine (1997), Alesina et al. (2003), or Montalvo and Reynal-Querol (2003, 2005a).

by using the supply-push component of immigrant inflows as an instrumental variable. The supply-push component of immigrant inflows is a widely used instrumental variable in the labor economics literature (see e.g. [Card and DiNardo, 2000](#); [Card, 2001, 2009](#); [Saiz, 2003](#); [Ottaviano and Peri, 2005, 2006](#)). This instrumental variables estimation strategy has, however, not been used before to examine the causal effects that cultural diversity had on output growth at the US county level during the age of mass migration.

On the theoretical front, the cultural economics literature has suggested several potentially countervailing channels through which cultural diversity affects output growth. Cultural diversity can have a positive effect on output growth if a more diverse working-age population is associated with a greater variety of skills that in turn enable the production of a greater variety of goods and services (e.g. [Alesina and La Ferrara, 2005](#)). A more diverse and, in particular, a more polarized population can however also have detrimental effects on output growth if it is associated with increased social conflict and a reduction in the quality and quantity of public good provision. We examine these countervailing effects by constructing measures of cultural fractionalization and cultural polarization. While our measure of cultural fractionalization is strictly increasing in the number of groups, our measure of cultural polarization is maximized when two groups are of equal size. Our polarization measure is, therefore, closely related to [Horowitz's \(1985\)](#) statement that conflicts are more likely in societies where a large ethnic minority faces an ethnic majority. Conflict models such as those in [Esteban and Ray \(1999, 2011a,b\)](#) formalize the non-monotonic relationship between diversity and conflict emphasized by [Horowitz \(1985\)](#). These models predict that social tensions are greatest when there are two equally powerful groups that contest for resources.

Our first main finding is that increases in cultural fractionalization led to significant increases in output per capita during the 1870–1920 period. Focusing on within-county changes in cultural fractionalization to eliminate fixed county-specific characteristics, we find that a 1 percentage point increase in counties' cultural fractionalization increased output per capita by up to 2%. To link this result more closely to the cultural economics literature where a key argument for a positive effect of cultural fractionalization on output per capita is an increase in skill variety, we show that within-county increases in cultural fractionalization were associated with significant within-county increases in the occupational diversity of workers.

Our second main finding is that increases in cultural polarization had a significant negative effect on output per capita. Our fixed effects instrumental variables estimates yield that a 1 percentage point increase in cultural polarization decreased output per capita by up to 3%. The political economy literature has linked polarization to voracious redistribution ([Tornell and Lane, 1999](#); [Lane and Tornell, 1996](#)), a large government sector and distortionary taxation ([Azzimonti, 2011](#)), as well as violent conflict ([Esteban and Ray, 1999, 2011a,b](#); [Montalvo and Reynal-Querol, 2005a,b](#)). In line with this literature, we document that during the 1870–1920 period increases in polarization led to a significant increase in the tax quote and the number of public sector employees. We also provide some anecdotal evidence for conflict tensions among European immigrants.

The results from our empirical analysis also illustrate the importance of including polarization and fractionalization jointly in the regression model. This point was already made in the context of cross-country regressions by [Montalvo and Reynal-Querol \(2005a,b\)](#) who show that the effects of ethnic polarization on a variety of determinants of economic growth, such as investment and civil war, differ from the effects of ethnic fractionalization. Our within-county regressions show that, when the effect of fractionalization on economic growth is estimated without controlling for the (negative) effect of polarization on economic growth the obtained coefficient on fractionalization is negative and statistically significant. Hence, estimating the effects of fractionalization on economic growth without controlling for the effects of polarization would lead to the conclusion that an increase in fractionalization is bad for economic development. However, this would be a mistaken conclusion. Once the negative effect of polarization is controlled for in the regression model, the coefficient on fractionalization becomes positive and significant thus in line with the predictions from the theoretical literature that we discussed above.

A further finding of our within-county estimation approach is a significant mean reversion in the cultural fractionalization and polarization index. This finding is important for the empirical literature on the effects of cultural diversity: it implies that using initial cultural diversity indices to circumvent endogeneity problems will lead to coefficients that reflect the opposite of the true causal effect that within-county changes in cultural fractionalization and polarization have on output growth. Our finding of mean reversion in the fractionalization and polarization index is particularly important for studies that focus on periods of significant change in the cultural composition of the population.<sup>3</sup> Statistically, the mean reversion follows from the bounded nature of these indices on the unit interval. By definition, mean reversion implies that counties with initially higher levels of cultural fractionalization and polarization experienced subsequently smaller changes in fractionalization and polarization. Using initial values to examine how a change in the cultural diversity of the population induces a change in output per capita requires to deal, therefore, correctly with the mean-reverting time-series nature of these indices. We show that this mean reversion of the cultural diversity indices can be accounted for by using an IV approach where the change in fractionalization and polarization is instrumented by the initial level. Via the first-stage, the IV approach takes into account the mean reversion in the cultural fractionalization and polarization index. Importantly,

<sup>3</sup> Changes in the cultural composition of the population may occur because of significant immigration inflows, as it was the case during the age of mass migration. Changes in the cultural composition of the population may however also occur during episodes of major intra-state conflict such as, for example, during civil war.

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