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### Authors

Gao, Manjing

Oselin, Sharon S

Mahutga, Matthew C



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# Minority threat and social context: Global value chains and the carceral effect of ethnic polarization in rich democracies

Manjing Gao [a,b,*], Sharon S. Oselin [b], Matthew C. Mahutga [b]

[a] Department of Sociology, Chapman University, Orange, California, USA
[b] Presley Center of Crime & Justice Studies, University of California, Riverside, USA

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ABSTRACT

Integrating minority threat theory with the political economy of globalization, this study theorizes and empirically tests how macrostructural changes via global value chains (GVCs) shape the carceral consequences of rising ethnic polarization in rich democracies. GVC integration should increase economic insecurity, activate and escalate latent racial and ethnic tensions, intensify dominant groups' perceptions of minority threat, and shift state strategies toward more punitive forms of social control. Thus, ethnic polarization should more strongly increase incarceration rates in countries more deeply integrated into GVCs. Using panel data from 20 countries and fixed-effects models, we examine how GVC integration moderates the relationship between within-country changes in ethnic polarization and incarceration rates. Our findings provide strong evidence that GVC integration amplifies the positive effect of ethnic polarization on incarceration. We conclude by reflecting on the broader implications of these findings for understanding the intersection of globalization, ethnic polarization, and incarceration.

## 1. Introduction

Over the past several decades, many rich democracies—i.e., the most economically developed countries with established democratic systems—have experienced rising incarceration rates and expanding prison populations (Byrne et al., 2015; Clegg et al., 2024). To explain this trend, scholars have increasingly turned to minority threat theory, which posits that dominant groups may perceive racial and ethnic minorities as economic, political, or criminal threats and respond with heightened forms of social control, including increased incarceration (Blalock, 1967; Duxbury, 2023; Feldmeyer & Cochran, 2018; Liska, 1992).

However, recent criminological research has raised important theoretical challenges to minority threat theory. First, the mere presence of minority populations does not inherently provoke perceptions of threat; rather, such perceptions depend upon broader structural and institutional contexts that increase the likelihood of shifting ethnic composition into conflict (Smith, 2021; Stults & Swagar, 2018). Second, the translation of perceived threat into punitive state responses—such as increased incarceration—is not automatic but is conditioned by the relative strength, availability, legitimacy, and political support for incarceration vis-à-vis non-punitive alternatives, such as welfare and labor market institutions (Lappi-Seppälä, 2008). These insights challenge the assumption that minority presence uniformly produces punitive state action and call for greater attention to the macrostructural conditions that activate and escalate threat perceptions into carceral outcomes.

Empirically, cross-national studies have extended minority threat theory and carceral outcomes beyond the U.S., contributing to the refinement of key concepts and measurement. However, the findings remain mixed: while some studies report positive associations (Jacobs & Kleban, 2003), others find null or inconsistent effects (Ruddell, 2005; Ruddell & Urbina, 2004), and still others reveal non-linear or measurement-sensitive results (Davis & Gibson-Light, 2020; Marier & Cochran, 2023). Many of these studies also use ethnic diversity as a measure of ethnic composition, which may not fully capture the conflict-oriented logic emphasized by minority threat theory (c.f. Marier & Cochran, 2023), treat ethnic composition as a static attribute despite the theory's emphasis on demographic change as a central trigger of perceived threat (Blalock, 1967; Liska, 1992), and overlook time-invariant country-level heterogeneity. As a result, existing research has yet to fully account for the dynamic and context-contingent nature of the relationship between ethnic composition and punitive outcomes.

* Corresponding author at: Department of Sociology, Chapman University, Orange, California, USA.
*E-mail address:* gaomanjing@gmail.com (M. Gao).

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This study addresses these theoretical and empirical limitations by introducing a new macrostructural moderator: global value chains (GVCs), defined as the international networks of production, trade, and services through which goods are increasingly produced across multiple countries. In the context of this paper, GVCs specifically refer to production relationships in which "leading" firms in rich democracies coordinate production via supplier firms in the global South – that is, countries that are less economically developed. Over the past thirty years, offshoring and trade through GVCs has become one of the most significant transformations in the political economy of rich democracies (Milberg & Winkler, 2013). GVC integration disrupts labor markets, displaces workers, and intensifies economic insecurity and inequality, particularly for low-skill workers who are overrepresented in incarcerated populations (Goldin & Katz, 2008; Mahutga et al., 2017; Milberg & Winkler, 2013). It also erodes the capacity of social welfare and labor institutions (Giuliani & Madama, 2025; Mahutga et al., 2025), fuels the rise of right-wing populism and nationalist, xenophobic political narratives (Mahutga & Maldonado, 2018; Rodrik, 2021), and deepens racial inequalities (Gao et al., 2025). Together, these processes heighten both material and symbolic perceptions of minority threat, and weaken institutional support for non-punitive responses, thereby increasing the likelihood that minority groups will be met with punitive reactions.

By integrating minority threat theory with the political economy of globalization, we argue that the carceral consequences of rising share of ethnic minorities are shaped by the degree of GVC integration. Specifically, we test whether higher levels of GVC integration amplify the relationship between changes in ethnic polarization and incarceration rates in rich democracies. Using panel data from 20 countries, we analyze whether within-country increases in ethnic polarization have a stronger effect on incarceration in contexts of deeper GVC integration, while accounting for unobserved time-invariant factors. To our knowledge, this is the first study to systematically examine how global economic restructuring interacts with ethnic polarization to influence penal outcomes. Our findings largely support this hypothesis: the positive association between ethnic polarization and incarceration becomes stronger as GVC integration increases. Moreover, this moderating effect is substantial. Estimated effects of ethnic polarization are 2.4 times larger in countries with maximal GVC integration than in those with minimal integration, and we estimate that incarceration rates would be approximately 33% lower if minority threat dynamics operated in the absence of GVC integration. We conclude by reflecting on the broader implications of these findings for understanding the intersection of globalization, minority threat, and state punishment.

## 2. Theoretical framework

### 2.1. Minority threat and punishment: a conditional relationship?

Minority threat theory posits that the presence—and especially the growth—of racial and ethnic minority populations is associated with heightened forms of social control (Blalock, 1967; Blumer, 1958). Originally building on Blumer's (1958) group position argument and further developed by Blalock (1967), the theory suggests that dominant groups may perceive minority populations as threats to their economic, political, or cultural power, and respond with intensified efforts to regulate and control these groups (Stults & Swagar, 2018).

Perceived threats from minority groups can manifest in multiple forms. Following Blalock (1967), *economic threat* arises from fears of competition over jobs, housing, and other scarce economic resources. Here, a large or growing minority group heightens concerns about economic competition among majority groups, prompting efforts to preserve its economic standing. *Political threat,* in contrast, reflects anxieties about the erosion of majority dominance as minority groups gain political power and influence through mobilization and representation (Blalock, 1967; Stults & Swagar, 2018). Minority groups are also frequently constructed as *criminal threats*, symbolically linked to crime, disorder, and moral decline (Duxbury, 2023; Feldmeyer & Cochran, 2018; Liska, 1992). In summary, in response to anxieties over real or imagined competition posed by racial and ethnic minorities, the dominant group in power resorts to increased punitiveness to maintain a group-level position of superiority (Davis et al., 2022; Marier & Cochran, 2023; Quillian, 1995).

Studies on minority threat and punishment often posit a two-stage process. In the first stage, the presence or growing proportion of racial and ethnic minorities is assumed to generate conflict and perceived threat among the dominant group. In the second stage, these perceived threats prompt the dominant group to respond with heightened social control, often enacted through the criminal justice system. Each stage rests on core assumptions: that a larger share of racial and ethnic minorities inherently signals conflict or threat, and that the dominant group will respond to this threat with formal punitive measures.

However, recent research has called both assumptions into question. Scholars argue that the mere presence of minority populations does not necessarily equate to perceived threat or conflict (Davis & Gibson-Light, 2020; Smith, 2021). As Stults and Swagar (2018, p. 152) note, minority presence "is not necessarily indicative of threat, but perhaps only the potential for perceptions of threat" (see also Stringer & Holland, 2024). Moreover, the assumption that perceived threat straightforwardly leads to formal punitive controls such as incarceration overlooks the structural and institutional contexts that shape whether and how dominant groups respond to minority groups. For example, social welfare policies may function as alternative tools of social control in place of incarceration (Lappi-Seppälä, 2008). It is therefore important to recognize that the relationship between minority presence, perceived threat, and punitive responses is shaped by broader contextual factors. As Stults and Swagar (2018, p. 165) emphasize, "a goal of future research from the threat perspective should be to continue identifying the conditions under which objective characteristics of places are expected to translate into perceived threat, and in turn, under what conditions perceived threat is expected to translate into outcomes related to social control."

This raises a central theoretical question: Under what structural conditions does the presence of racial or ethnic minorities escalate into perceived threat, and when does that threat translate into punitive responses such as incarceration? While some U.S.-based studies have examined how institutional or organizational factors—like police department characteristics (Eitle & Monahan, 2009) or local political structures (Stucky, 2012)—moderate these dynamics, recent cross-national research is beginning to explore institutional moderators such as democratic governance (Davis et al., 2022). Yet, much of the minority threat literature remains nationally focused and insufficiently responsive to transnational macroeconomic structural changes and broader economic restructuring. This gap persists despite longstanding calls to situate punishment within wider global frameworks. As Sparks (2003) notes, "it is also important to understand [that] policies related to punishment sometimes depend on broader transnational arrangements" (see also Ruddell & Urbina, 2004).

This study addresses that gap by introducing GVCs as a critical macroeconomic structural factor that shapes how ethnic composition is interpreted and managed. We argue that GVC integration alters the structural context in which minority populations are perceived. GVCs may heighten racial and ethnic tensions, amplify perceptions of minorities as threats, weaken institutional alternatives to incarceration, and increase penal governance. As a result, incarceration may become a more likely and preferred instrument of social control. To our knowledge, this is the first study to both theorize and empirically test how GVC integration interacts with ethnic polarization to shape punitive carceral outcomes. By identifying the macroeconomic conditions under which ethnic composition translates into perceived threat and escalates into state-sanctioned punishment, we make a novel and important contribution to the minority threat literature.

#### 2.1.1. Empirical issues

Empirical studies have examined the effects of racial and ethnic composition on perceptions of racial and ethnic threat, punitive attitudes, and various criminal justice outcomes, including police force size and expenditures, arrest rates, capital punishment, and sentencing practices (Feldmeyer & Cochran, 2018; Kent & Jacobs, 2004; Mosher, 2001; Ousey & Unnever, 2012; Sever, 2001; Wang & Mears, 2010). Although incarceration has become an increasingly prominent form of social control worldwide (Byrne et al., 2015), minority threat theory has been applied to incarceration rates less frequently and primarily within the U.S. context (Duxbury, 2023; Greenberg & West, 2001; Jacobs & Carmichael, 2001). To date, only a handful of studies—five in total—have examined this association cross-nationally (Davis & Gibson-Light, 2020; Jacobs & Kleban, 2003; Marier & Cochran, 2023; Ruddell, 2005; Ruddell & Urbina, 2004).

These cross-national studies have advanced the field by testing the generalizability of minority threat theory beyond the United States, refining conceptual and measurement approaches, and exploring various dimensions of minority threat as well as functional forms of the ethnic composition–incarceration relationship. The findings, however, remain mixed. Some studies report a positive association (Jacobs & Kleban, 2003), while others find null or inconsistent results (Ruddell, 2005; Ruddell & Urbina, 2004), and some document non-linear effects (Marier & Cochran, 2023). These mixed results raise the possibility of parameter heterogeneity — that is, the relationship between ethnic composition and incarceration varies across broader social contexts, which in turn suggests the need to specify the conditions under which ethnic minorities translate into punitive outcomes.[1]

### 2.2. Do GVCs increase the carceral effect of ethnic polarization?

The preceding section suggests the relationship between ethnic polarization and incarceration may vary across social contexts. In this section, we introduce GVCs as a macro-structural moderator and outline theoretical arguments for how GVC integration *might* shape national contexts in ways that amplify the carceral response to ethnic polarization. We first define GVCs as they are used in this study, and then explain how GVC integration moderates the relationship between ethnic polarization and incarceration.

#### 2.2.1. What are GVCs?

GVCs arise when different stages of production are distributed across multiple firms and geographic locations. Research on GVCs often emphasizes the relationships between "leading" firms in rich democracies and their supplier firms in the global South. These suppliers are sometimes foreign-owned subsidiaries but more often operate as contract-based firms (e.g., Gereffi, Humphrey, & Sturgeon, 2005). As countries become more integrated into GVCs, production shifts abroad and rich democracies increasingly import manufactured goods from their global South partners. Over the past three decades, offshoring and trade through GVCs have emerged as a central transformation in the political economy of rich democracies (Milberg & Winkler, 2013).

A defining feature of these relationships is the asymmetrical bargaining power of the leading firms, as suppliers in the global South can be easily substituted. These asymmetrical exchange conditions generate downward price pressures on manufacturing imports supplied by global South suppliers, and produce a range of negative economic and political consequences in importing countries (Bair & Mahutga, 2023). Rising manufacturing imports from low-wage countries in the global South through GVCs disrupt labor markets, depress wages, and reduced job security —particularly among workers in rich democracies, many of whom are socioeconomically vulnerable and exhibit characteristics strongly correlated with incarceration (Goldin & Katz, 2008). GVC integration also deepens racial inequalities in labor markets, erodes social welfare and labor institutions, and fuels the rise of right-wing populism and nationalist, xenophobic political narratives (Gao et al., 2025; Mahutga et al., 2017; Rodrik, 2021).

Together, these negative economic and political consequences from GVC integration create a unique social context in which minority threat dynamics are embedded. While GVCs may affect incarceration rate directly, we remain agnostic on that question here. Instead, we draw on the broader literature on the socio-economic and political effects of GVCs to identify multiple channels through which GVCs can exacerbate minority threat dynamics through trade. In particular, we suggest that GVCs amplify the carceral response to ethnic polarization by (1) transforming demographic composition into racial and ethnic tensions and heightening dominant group's perception of minority threat, and (2) increasing support for punitive governance and weakening institutional alternatives for managing these social tensions.

#### 2.2.2. GVCs and racial and ethnic tension

Integration into GVCs can heighten economic insecurity and intensify competition among workers in rich democracies, fostering economic, political, and cultural tensions along racial and ethnic lines. Rising manufacturing imports from low-wage countries in the global South have contributed to declines in domestic manufacturing, increased income inequality, and other labor market disruptions—including job insecurity, wage stagnation, and unemployment—particularly among low-skilled workers who are already economically vulnerable (Alderson, 1999; Alderson & Nielsen, 2002; Autor et al., 2013; Dorn & Levell, 2024; Mahutga et al., 2017; Mahutga & Curran, 2022; Milberg & Winkler, 2013). These economic strains can intensify competition over limited labor market opportunities and heighten perceptions of zero-sum competition over wages, housing, welfare benefits, and other resources, especially between dominant and minority groups (Dollar, 2014; Eitle et al., 2002). Evidence suggests that GVC integration also exacerbates racial inequality in labor markets and occasionally produced relatively larger income gains among minority workers than majority workers, potentially amplifying dominant-group percepts of minorities as economic threats (Gao et al., 2025). These dynamics can foster resentment among dominant groups who view racial and ethnic minorities as economic threats—expressed through narratives like "They took our jobs."

Beyond economic threats, GVCs can also intensify political, cultural, and criminal threat perceptions among dominant social groups. Studies show that import shocks from the global South are linked to rising support for right-wing populism in both the United States and Europe (Autor et al., 2020; Barone & Kreuter, 2021; Choi et al., 2024; Colantone & Stanig, 2018; Dippel et al., 2022; Malgouyres, 2017). This shift is driven both by material economic grievances, as well as identity-based anxieties. As Rodrik (2021) notes, "[GVC-induced] economic shocks can heighten feelings of insecurity, inducing voters to make sharper distinctions between insiders ('us') and ethnic, religious, or racial outsiders ('them')" (p. 140). These dynamics can thus increase hostile attitudes toward minorities (Colantone & Stanig, 2018; Ferrara, 2023).

Not only can the economic effects of GVCs increase racial hostilities and resentment among majority populations, but partisan political actors can both respond to these anxieties, and also actively shape them (Cox, 2019; Hacker & Pierson, 2020; Rodrik, 2021). These dynamics can raise electoral support for parties that are more likely to frame racial and ethnic minorities as contributors to social disorder. For example, political leaders increasingly deploy campaign strategies that prime latent

[1] Of course these discrepancies could also reflect differences in empirical approaches such as analytical samples, time periods, statistical model specifications, and the operationalization of minority threat (Davis & Gibson-Light, 2020; Marier & Cochran, 2023). As we describe below, our study uses the most comprehensive sample of rich democracies covering the longest time period to date, deploys estimators that control for all time-invariant unobserved factors across countries, as well as two time-varying measures of ethnic heterogeneity (polarization and fractionalization).

ethnoreligious divisions, redirecting public discontent away from structural economic crises and toward identity-based scapegoats (Rodrik, 2021). Such efforts further increase perceptions of minorities as economic, political or criminal threats among dominant groups and, in some cases, with greater majority-group aggression and intergroup violence, including hate crimes (Dugan & Chenoweth, 2020; Feinberg et al., 2022; Jacobs & Tope, 2008; Jacobs & van Spanje, 2021; Mendelberg, 2001; Vogel & Messner, 2024). In summary, GVC integration moderates the first stage of minority-threat theory. Import shocks from GVC integration create economic strain and increase support for right-wing populism, which heightens racial and ethnic tension, and results in a social context where minorities are more likely to be perceived as threats.

#### 2.2.3. GVCs and the rise of punitive governance

GVC integration creates economic strain and raises electoral support for right-wing parties that advance racialized law-and-order agendas with more punitive criminal justice policies that expand incarceration (Rodrik, 2021; Vasiliev, 2023; Yates & Fording, 2005). In addition, the state may deploy incarceration not only to manage the economic anxieties of dominant groups but also as a tool to regulate labor market disruptions and absorb surplus labor generated by GVCs (Rusche & Kirchheimer, 1939). Together, these dynamics contribute to a broader punitive turn across rich democracies, marked by the rise of penal governance and the proliferation of tough-on-crime policies disproportionately targeted at racial and ethnic minorities (Downes, 2011; Garland, 2001; Muncie, 2011; Simon, 2007; Wacquant, 2001).

At the same time, GVCs may contribute to punitive governance by eroding egalitarian institutional alternatives that traditionally mitigate ethnic and racial tensions. For example, GVC-driven economic restructuring may contribute to the retrenchment of the welfare state—a key institution that has historically provided non-punitive means to manage social tensions in many rich democracies (Giuliani & Madama, 2025; Huber & Stephens, 2001; Lappi-Seppälä, 2008). Although welfare state may, in some contexts, generate intergroup tensions, comparative research suggests that the contraction of redistributive programs can weaken the state's capacity to alleviate economic insecurity and foster social trust through inclusive social support (Lappi-Seppälä, 2008).[2] Similarly, GVCs weaken labor unions, a key institution that historically channeled economic grievances and fostered cross-racial solidarity (Mahutga et al., 2025; Rosenfeld & Kleykamp, 2009, 2012; Stepan-Norris & Zeitlin, 2003). As union density declines, the capacity to address economic and racial tensions through collective bargaining and political negotiation diminishes. Taken together, GVC integration should moderate the second stage of the minority threat process —how perceived threats are translated into formal punishment. By simultaneously strengthening political and public support for punitive responses and undermining egalitarian institutions that could otherwise reduce racial and ethnic tensions through social protection or inclusion, GVC integration makes incarceration a more central and politically viable tool for managing perceived minority threats.

By way of summary, GVC integration intensifies economic insecurity, amplifies perceptions of minority threat, strengthens support for punitive governance, and weakens institutional alternatives to incarceration. Thus, we *hypothesize* that the positive association between ethnic polarization and incarceration will be stronger when countries are more deeply integrated into GVCs.

[2] Empirical evidence also suggests that more generous welfare states are more likely to adopt lenient and rehabilitative penal practices emphasizing correctionalism, rehabilitation, and treatment over incarceration, which implies a weaker link between perceptions of minority threat and incarceration (Garland, 2017; Lacey et al., 2018; Lappi-Seppälä, 2011; Sutton, 2004).

## 3. Data and methods

### 3.1. Data and sample

Our sample comprises 20 rich democracies observed between 1961 and 2013. Country-year inclusion is determined by the availability of all necessary data and includes: Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Greece, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States. Most countries (14 out of 20) have data covering the majority of the 1961–2013 period. The remaining six have shorter time series, either because they did not exist as independent statistical units for the full period (e.g., Belgium and Germany), or due to country-specific data limitations. As a result, we analyze an unbalanced panel consisting of 854 country-year observations.

### 3.2. Measures

#### 3.2.1. Dependent variable

Our dependent variable, the incarceration rate, is defined as the number of incarcerated individuals—either pre-trial detainees/remand prisoners or those convicted and sentenced—per 100,000 of the national population. This measure is collected from the *World Prison Brief* in the *World Prison Population List* (Fair & Walmsley, 2024), which compiles data from national prison administrations or the respective ministries overseeing corrections. It is widely used in cross-national research on incarceration, including studies on minority threat (Jacobs & Kleban, 2003; Marier & Cochran, 2023; Ruddell, 2005; Weiss et al., 2020). Since these data are not consistently reported on an annual basis, we follow prior research in applying linear interpolation to estimate annual values (Davis et al., 2025; Kang-Brown, 2015; Sutton, 2013). Results are substantively similar when using only observed (non-interpolated) values (see sensitivity analysis for details). To address skewness, we apply a logarithmic transformation to the incarceration rate.[3]

#### 3.2.2. Independent variable

Most studies of minority threat measure ethnic composition using the ethnic fractionalization index (e.g., Jacobs & Kleban, 2003; Ruddell, 2005; Ruddell & Urbina, 2004), which captures ethnic diversity but may not fully reflect the threat dynamics central to the theory. Ethnic polarization, in contrast, emphasizes the presence of sizeable minority groups in potential competition, aligning more closely with minority threat logic (Marier & Cochran, 2023). As Steele et al. (2022, p. 46) note, "Measures of fractionalization emphasize the number of groups within a population, while measures of polarization emphasize the compositional imbalance of groups within a population." Higher levels of ethnic polarization indicate a population structure more conducive to intergroup tension and perceived threat, and it has been shown to predict social and political conflict more consistently than fractionalization (Montalvo & Reynal-Querol, 2005).

Existing studies also often treat minority threat as static, measuring the relative size of minority versus majority populations at one point in time and then projecting it forward. Yet, majority–minority relations are inherently dynamic, and changes in group size or distribution can be as,

[3] Minority threat can operate through targeted mechanisms, in which racial and ethnic minorities are disproportionately incarcerated, or diffuse mechanisms, which produce broader increases in incarceration across the population (Zane, 2018). Although targeted threat may align more closely with classical theory, we focus on the diffuse form and use overall incarceration rates for two reasons: cross-national data on minority-specific incarceration are unavailable, and dominant-group demands for social control may drive generalized expansions of incarceration beyond specific minority groups (Marier & Cochran, 2023).

or even more threatening than absolute size (Blalock, 1967; Liska, 1992). While some U.S.-based studies have adopted a dynamic perspective by using demographic change as an indicator of threat (e.g., Chamlin, 1989; Feldmeyer et al., 2015; King & Wheelock, 2007), this approach has rarely been applied to research on incarceration, particularly in cross-national contexts where measuring ethnic heterogeneity in a comparable way is more difficult.

To address these limitations, we use a time-varying measure of ethnic polarization, which better captures the dynamic nature of minority threat theory. The ethnic polarization index (Reynal-Querol, 2002) captures the extent to which a population is divided into two large and similarly sized ethnic groups. It measures the distance of a country's group distribution from a perfectly bipolar structure — i.e., two groups each comprising 50% of the population—based on the assumption that the most polarized societies are those in which two equally sized groups are in potential competition or conflict. This index ranges from 0 to 1, with higher values indicating greater ethnic polarization. We use ethnic composition data from the Composition of Religious and Ethnic Groups (CREG) Project at the University of Illinois (Nardulli et al., 2012). The ethnic polarization index is calculated using the formula from Montalvo and Reynal-Querol (2005):

$$\textit{Ethnic Polarization} = 1 - \sum_{i=1}^{N} \left( \frac{.5 - S_{ij}}{.5} \right)^2 s_{ij}$$

where $s_{ij}$ is the share of ethnic group $i$ $(i = 1 \ldots N)$ in the country $j$.

Nevertheless, we assess the robustness of our findings using the ethnic fractionalization index as an alternative specification because the two measures may capture similar underlying social dynamics despite their different forms.[4] The ethnic fractionalization index also ranges from 0 to 1, with higher values indicating greater heterogeneity. It is calculated following Alesina et al. (2003):

$$\textit{Ethnic Fractionalization} = 1 - \sum_{i=1}^{N} S_{ij}^2$$

#### 3.2.3. Moderating variable

To capture the extent of GVC integration in rich democracies, we use manufacturing imports from the global South—a widely recognized indicator (Alderson & Nielsen, 2002). However, because import volume tends to scale with country size, raw figures can distort cross-national comparisons. To address this, we adopt a refined normalization strategy developed by Mahutga et al. (2017), which calculates the share of manufacturing imports from the global South (non-OECD countries as well as Chile, the Czech Republic, Estonia, Hungary, Korea, Mexico, Poland, the Slovak Republic, Slovenia, and Turkey) relative to a country's total imports. This approach captures the pattern rather than the level of trade, reducing bias associated with absolute trade volumes and enabling more accurate comparisons of GVC integration across countries (see Mahutga et al., 2017 for details). Our data on global South manufacturing imports and total imports come from the Comparative Welfare States (CWS) dataset (Brady et al., 2020) and OECD. We log transform this measure (base 10) to reduce skewness.

#### 3.2.4. Control variables

To account for factors that may explain cross-national variation in incarceration, we include a set of control variables informed by prior research (Jacobs & Kleban, 2003; Marier & Cochran, 2023; Ruddell & Urbina, 2004; Weiss et al., 2020): the homicide rate, economic development, the proportion of young males, inflation, and unemployment. We control for the **homicide rate** as a proxy for overall crime, a key driver of incarceration (Miethe et al., 2017). It is measured as the age-standardized death rate per 100,000 persons due to intentional homicide, based on World Health Organization (WHO) (2014) definitions. This variable is log-transformed to reduce skewness and lagged by one year to allow for a lag in the response of criminological policy to crime rates. Data are drawn from the WHO Mortality Database. **Economic development** can shape interaction by influencing the state's institutional capacity to respond to crime through formal mechanisms such as imprisonment. We measure economic development using a composite index based on four correlated indicators: logged GDP per capita (Penn World Table from Feenstra et al., 2015), life expectancy (CWS dataset), infant mortality rate, and urban population percentage from the World Bank World Development Indicators (World Bank, 2024). Following previous research (Messner & Rosenfeld, 1997; Weiss et al., 2020; Weld & Roche, 2017), we apply principal component analysis to extract a single development factor ($\alpha = 0.88$, Eigenvalue = 2.92), capturing the shared variation among the indicators while avoiding multicollinearity from including them separately. The **percentage of young males**—defined as the share of the population that is male and aged 15 to 24—is included to reflect the demographic group most likely to be incarcerated globally. This data comes from the United Nations World Population Prospects (United Nations, 2022). Finally, we include inflation rate and unemployment as indicators of economic stress, both of which may increase crime rates and societal demand for punitive responses (Clegg & Usmani, 2023; Ruddell & Urbina, 2004). **Inflation** is measured as the year over year absolute change in the consumer price index, and **unemployment** is defined as the percentage of unemployed persons in the civilian labor force, harmonized for international comparability. Both indicators are from the CWS dataset (Brady et al., 2020). The unemployment rate is lagged by one year to account for the potential delay between the onset of unemployment and incarceration, since unemployment benefits and other sources of income may temporarily mitigate the effects of job loss.[5]

## 4. Methods

Existing cross-national studies on minority threat and incarceration often overlook stable unobservable country-level factors—such as historical legacies of slavery, legal traditions, institutional structures, and cultural norms—that may confound the relationship. To address this, we employ panel regression analysis with country-fixed effects to account for unobserved, time-invariant differences across countries that could confound the association between ethnic polarization and incarceration. When coupled with the time-varying measure of ethnic polarization, this approach enables us to better capture the dynamic nature of minority threat theory by assessing how within-country changes in ethnic polarization are associated with changes in incarceration rates. We also include a linear time trend to account for unmeasured linearly changing factors that may similarly affect incarceration rates in all advanced industrial democracies in our sample.

Our models are estimated stepwise. First, we examine the association between ethnic polarization and incarceration, adjusting for baseline covariates. Next, we include an interaction term between ethnic polarization and global South imports to test our hypothesis that GVC integration amplifies the association between ethnic polarization and incarceration.

Diagnostic tests indicate the presence of spatial correlation between countries, serial correlation within countries, and heteroskedasticity.

[4] Using the test procedure developed by Lind and Mehlum (2010), we formally examined whether the relationships between both ethnic composition measures and incarceration were non-linear over the observed data range, but found no evidence to support such patterns.

[5] We also estimate models using contemporaneous homicide and unemployment rates, and the results are substantially identical to those reported here. In the main specification, we include the contemporaneous inflation because it immediately affects the real value of income, making delayed effects on incarceration less likely. Nevertheless, using lagged values of inflation changes yields substantively comparable coefficients.

Thus, we use panel-corrected standard errors that are robust to all of these violations (Beck & Katz, 1995). In the most saturated model, we estimate the following,

$$y_{it} = \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 (x_{1it} \times x_{2it}) + Z_{it}\gamma + \alpha_i + \delta t + \varepsilon_{it}$$

where $y_{it}$ denotes the base-10 logarithm of the incarceration rate for country $i$ in year $t$; $x_{1it}$ is ethnic polarization; $x_{2it}$ represents global South imports; and $x_{1it} \times x_{2it}$ captures their interaction. The vector $\mathbf{Z}_{it}$ includes all baseline control variables. Country fixed effects ($\alpha_i$) account for unobserved, time-invariant heterogeneity across countries, while the linear time trend ($\delta t$) captures unmeasured linearly changing factors common to all countries. The error term $\varepsilon_{it}$ represents idiosyncratic shocks. $\beta_1$ is the coefficient of ethnic polarization when global South imports is zero; $\beta_2$ captures the effect of global South imports when ethnic polarization is zero; and $\beta_3$ measures the interaction effect, indicating how the relationship between ethnic polarization and incarceration changes as global South imports increases. $\gamma$ is a vector of coefficients for baseline control variables.

## 5. Results

Table 1 reports the descriptive statistics (lower panel) and bivariate correlations (upper panel) for all variables used in the analysis. The average logged incarceration rate is 1.93. Using the raw, untransformed data, this corresponds to approximately 110 prisoners per 100,000 people. The ethnic polarization index has a mean of 0.33, which suggests that, on average, countries in our sample have a moderately polarized ethnic composition. The average logged value of global South imports is −1.04, with an unlogged average of 0.12, indicating that approximately 12% of total imports, on average, come from the global South. Ethnic polarization is positively correlated with incarceration ($r = 0.599$, $p < 0.001$), and global South imports are also positively associated with incarceration rates ($r = 0.503$, $p < 0.001$).

Table 2 presents results from our panel regression analysis. Model 1 shows a strong positive association between ethnic polarization and incarceration: a one-unit increase in ethnic polarization is associated with a 0.468 increase in the logged incarceration rate ($p < 0.001$). Since the ethnic polarization index ranges from 0 to 1, a full one-unit increase represents the entire spectrum of polarization. More practically, a 0.1 increase in ethnic polarization corresponds to about a 11% increase in incarceration rates (calculated as $(10^{(0.468 \times 0.1)} - 1) \times 100$), indicating that even modest increases in polarization correspond with notable rises in incarceration. Model 2 introduces the interaction between ethnic polarization and global South imports. Consistent with our hypothesis, the interaction term is positive and significant ($b = 0.284$, $p < 0.001$), suggesting that the positive relationship between ethnic polarization and incarceration is amplified as countries become more deeply integrated into global value chains. Among control variables, unemployment consistently predicts higher incarceration across all models. Other controls, including the development index, inflation, homicide, and percent young male, show limited or inconsistent associations.

To illustrate the interaction, Fig. 1 plots the marginal effects of ethnic polarization on incarceration at the minimum, mean, and maximum values of global South imports observed in our sample. While ethnic polarization is positively associated with incarceration across all levels, the magnitude of the effect grows substantially. At the minimum level of global South imports, a 0.1-point increase in ethnic polarization is associated with an 8.5% increase in incarceration; at the mean, a 15.3% increase; and at the maximum, nearly a 20.5% increase. The impact of ethnic polarization on incarceration more than doubles between low and high levels of global South imports.

### 5.1. Sensitivity analyses

We conduct two sets of sensitivity analyses to assess the sensitivity of our findings against various theoretical and empirical considerations. First, we evaluate the robustness of our findings to alternative measures of ethnic composition, additional controls, and a quasi-placebo test. Results are reported in Table 3. First, we replace our main measure of ethnic polarization with the ethnic fractionalization index described in the measurement section. The interaction between global South imports and ethnic fractionalization remains positive and significant ($b = 0.168$, $p < 0.01$; Model 1). The similar interaction effects across ethnic polarization and ethnic fractionalization suggest that our findings are not driven by a particular operationalization of ethnic composition. Second, given that several cross-national studies on minority threat and incarceration include income inequality as a control (Jacobs & Kleban, 2003; Marier & Cochran, 2023; Ruddell, 2005), we add the Gini index from the Standardized World Income Inequality Database (2023) (Solt, 2020). Despite a reduction in sample size due to missing data ($N = 763$), the interaction term remains robust ($b = 0.341$, $p < 0.001$; Model 2), indicating that our main findings are robust the inclusion of income inequality as an additional control.

Third, the core of our theoretical argument centers on the socio-economic and political consequences of the asymmetric exchange conditions between leading firms and their suppliers. Since these exchange conditions are not directly observable, we conduct a quasi-placebo test by replacing global South import penetration with imports from global North countries, where such asymmetries are absent. We measure global North imports as a share of total imports, analogous to our primary global South imports measure, and then replicate the regression model to assess whether the interaction effect is specific to global South imports. Results from Model 3 indicate that the interaction between global North imports and ethnic polarization is non-significant and opposite in sign to the direction we observed for the interaction between ethnic polarization and global South imports. This suggests that the interactive effect we observe is specific to global South imports consistent with our arguments, and does not reflect a general pattern of rising imports or global integration over time.

Next, we evaluate the robustness of our findings to different model specifications. The results are displayed in Table 4. The results presented in Table 2 only accounted for a linear time trend. Thus, we replace the linear time trend with year fixed effects to better account for unobserved time-specific shocks or trends—such as regional economic fluctuations or shifts in penal policy. Results from these two-way fixed effects model confirm the main findings: the interaction remains positive and statistically significant ($b = 0.300$, $p < 0.001$; Model 1). Next, we use only the observed (non-interpolated) incarceration data, which dramatically reduces the sample size to 249 country-years. Nevertheless, the results are consistent with those based on the interpolated data (Model 2).[6] Model 3 addresses two concerns. First, it re-estimates our main models with clustered standard errors. Second, it assesses the degree to which our results depend on the composition of our sample. Here we implement a jackknife procedure that systematically omits one country at a time from the sample, and recalculates the coefficients and standard errors using the resulting variation in the estimates to conduct hypothesis tests. As shown in Model 3, the interaction remains positively and statistically significant at 0.05 level using both standard clustered standard errors (see asterisks on coefficients) and jackknife clustered standard errors (see asterisks on standard errors).

### 5.2. Substantive significance

The findings in Table 2 are consistent with our theoretical

[6] These data are too sparse to support a panel error correction model. Thus, we report fixed effects estimates with country-clustered standard errors.

**Table 1**
Correlations and Descriptive Statistics

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| (1) Incarceration Rate | | | | | | | | |
| (2) Ethnic Polarization | 0.599 | | | | | | | |
| (3) Global South Imports | 0.503 | 0.351 | | | | | | |
| (4) Percent Male Aged 15–24 | −0.089 | −0.126 | −0.535 | | | | | |
| (5) Homicide (t-1) | 0.484 | 0.280 | 0.141 | 0.289 | | | | |
| (6) Development Index | 0.274 | 0.415 | 0.782 | −0.575 | −0.069 | | | |
| (7) Inflation | 0.044 | 0.037 | −0.046 | 0.207 | 0.155 | 0.049 | | |
| (8) Unemployment (t-1) | 0.192 | 0.363 | 0.217 | −0.123 | 0.076 | 0.252 | 0.095 | |
| Mean | 1.931 | 0.331 | −1.036 | 7.329 | 0.083 | 0.035 | 1.818 | 6.139 |
| Std. Dev. | 0.272 | 0.244 | 0.326 | 1.108 | 0.288 | 1.426 | 1.262 | 3.896 |
| Min | 1.380 | 0.007 | −1.959 | 4.887 | −0.620 | −6.281 | −4.519 | 0.084 |
| Max | 2.878 | 0.889 | −0.358 | 10.239 | 1.023 | 2.354 | 9.117 | 24.792 |

Notes: $N = 854$. Incarceration rate, homicide rate, and global South imports are logged to reduce skewness. Inflation is the year-to-year absolute change of the consumer price index.

**Table 2**
Coefficients from Regression of Incarceration Rate on Ethnic polarization, Global South Imports, Interaction and Select Controls

| | (1) | (2) |
|---|---|---|
| Ethnic Polarization | 0.468*** | 0.912*** |
| | (0.116) | (0.142) |
| Global South Imports | | −0.020 |
| | | (0.020) |
| Global South Imports X Ethnic Diversity | | 0.284*** |
| | | (0.052) |
| Percent Male Aged 15–24 | −0.001 | −0.0002 |
| | (0.006) | (0.006) |
| Homicide (t-1) | 0.010 | 0.012 |
| | (0.008) | (0.009) |
| Development Index | −0.028* | −0.016 |
| | (0.013) | (0.013) |
| Inflation | 0.0001 | 0.0004 |
| | (0.001) | (0.001) |
| Unemployment (t-1) | 0.003** | 0.003** |
| | (0.001) | (0.001) |
| Time | 0.005*** | 0.002 |
| | (0.001) | (0.001) |

Notes: N = 854. Unstandardized Coefficients. Standard errors in parentheses, corrected for heteroskedastic, spatial and serial correlation; Incarceration rate, homicide rate, and global South imports are logged to reduce skewness $^{+}$ $p <$ 0.10, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

expectations, and the sensitivity analyses in Table 3 support the robustness of these results. We now ask how substantively important is GVC integration to the effect of ethnic polarization on incarceration. To do so, we conduct a counterfactual analysis comparing predicted incarceration rates under two scenarios. In the first, we constrain ethnic polarization at its initial within-country level over time and estimate incarcerates rates using Model 1in Table 2. This counterfactual thus shows how much incarceration there would have been in the absence of the growth in ethnic polarization. With the second, we constrain both global South imports and ethnic polarization to their initial levels, and estimate rates of incarceration using Model 2 in Table 2. This counterfactual thus shows how much incarceration there would have been in the absence of the interaction of ethnic polarization with GVC integration.

Fig. 2 illustrates these counterfactual incarceration trends in comparison to the observed trend. On average, incarceration increased by 49 prisoners per 100,000 persons, or 78% increase over the period. Consistent with minority threat theory, ethnic polarization had a sizable influence on incarceration rates by itself: incarceration would have increased by only 27 per 100,000, or 42%, on average, in the absence of the increase in ethnic polarization. However, the predicted increase in incarceration rate would have been much smaller still if the growth in ethnic polarization did not interact with the integration of rich democracies into GVCs. The counterfactual incarceration trend would have increased to only—8 per 100,000, on average, or roughly 12%

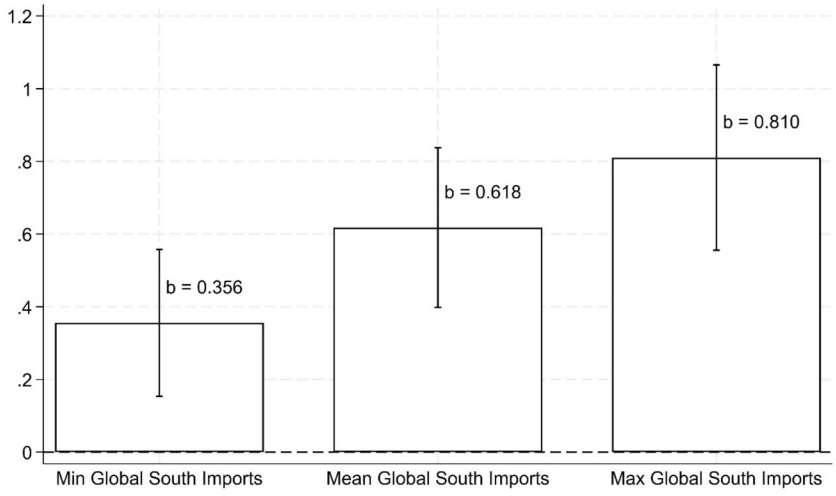



**Fig. 1.** Marginal Effects of Ethnic Polarization on Incarceration Rates.
Notes: Bar heights represent the marginal effect of ethnic polarization on incarceration rates at the minimum, mean, and maximum observed values of global South Imports. The capped vertical lines indicate 95% confidence interval. The coefficients displayed above the bars indicate the exact effect size at each level of global South Imports.

**Table 3**
Relevant Coefficients from Sensitivity Analyses Part I

| | (1) | (2) | (3) |
|---|---|---|---|
| | Ethnic Fractionalization | Gini Index | Global North Imports |
| Ethnic Composition | 1.605*** | 0.964*** | 0.475*** |
| | (0.236) | (0.147) | (0.117) |
| Imports | 0.016 | −0.014 | 0.092 |
| | (0.018) | (0.023) | (0.064) |
| Imports X Ethnic Composition | 0.168** | 0.341*** | −0.045 |
| | (0.055) | (0.059) | (0.121) |
| Percent Male Aged 15–24 | −0.001 | 0.012 | −0.003 |
| | (0.006) | (0.007) | (0.006) |
| Homicide (t-1) | 0.010 | 0.021* | 0.010 |
| | (0.008) | (0.010) | (0.008) |
| Development Index | −0.013 | 0.003 | −0.031* |
| | (0.013) | (0.014) | (0.013) |
| Inflation | 0.0003 | 0.001 | 0.001 |
| | (0.001) | (0.001) | (0.001) |
| Unemployment (t-1) | 0.002** | 0.003* | 0.003** |
| | (0.001) | (0.001) | (0.001) |
| Gini Index | | 0.004** | |
| | | (0.001) | |
| Time | 0.001 | 0.002 | 0.005*** |
| | (0.001) | (0.001) | (0.001) |
| *N* | 854 | 763 | 854 |

Notes: "Imports" refers to Global South imports in Models 1–2 and Global North Imports in Model 3. "Ethnic composition" refers to ethnic fractionalization in Model 1 and ethnic polarization in Models 2–3. Model 2 adds a control for income inequality (Gini Index). Model 3 provides a quasi-placebo test where we replace global South imports with global North imports. Unstandardized Coefficients. Standard errors in parentheses. Standard errors corrected for heteroskedasticity, spatial dependence, and serial correlation. Incarceration rate, homicide rate, and global South imports are logged to reduce skewness $^{+}$ p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

**Table 4**
Relevant Coefficients from Sensitivity Analyses Part II

| | (1) | (2) | (3) |
|---|---|---|---|
| | Year fixed effects | Non interpolation | Sample Composition |
| Global South Imports | −0.047* | 0.139 | 0.058 |
| | (0.020) | (0.119) | (0.127) |
| Ethnic Polarization | 0.923*** | 1.345*** | 1.533*** |
| | (0.125) | (0.328) | (0.387) |
| Global South Imports X Ethnic Polarization | 0.300*** | 0.631** | 0.635** |
| | (0.048) | (0.182) | (0.295) * |
| Percent Male Aged 15–24 | 0.012$^{+}$ | 0.003 | 0.005 |
| | (0.007) | (0.018) | (0.020) |
| Homicide (t-1) | 0.015 | 0.114 | 0.106 |
| | (0.009) | (0.081) | (0.079) |
| Development Index | −0.005 | 0.078* | 0.059 |
| | (0.013) | (0.028) | (0.051) |
| Inflation | 0.002$^{+}$ | −0.001 | −0.004 |
| | (0.001) | (0.006) | (0.005) |
| Unemployment (t-1) | 0.003** | 0.005 | 0.002 |
| | (0.001) | (0.003) | (0.005) |
| Time | | −0.010** | −0.008 |
| | | (0.004) | (0.005) |
| *N* | 854 | 249 | 854 |

Notes: Model 1 includes two-way fixed effects with year fixed effects (coefficients not reported). Model 2 uses the original incarceration rates (logged) without linear interpolation. Model 3 presents the jackknife estimation procedure to alleviate the concern that the results are driven by individual countries. Unstandardized Coefficients. Standard errors in parentheses. Model 1 uses standard errors corrected for heteroskedasticity, spatial dependence, and serial correlation. Model 2 employs country-clustered robust standard errors to account for heteroskedasticity and within-country serial correlation. Model 3 reports standard errors computed via a jackknife procedure clustered at the country level. In addition, we estimate robust standard errors clustered at the country level. In Model 3, asterisks on the standard errors indicate statistical significance from the jackknife procedure, while asterisks on the coefficients indicate statistical significance based on country-clustered robust standard errors, calculated using 19 degrees of freedom. Coefficients on year fixed effects are not reported. Incarceration rate, homicide rate, and global South imports are logged to reduce skewness. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

increase over the period. Thus, while ethnic polarization itself contributed to much of the incarceration trend over the period, these comparative counterfactual histories suggest its effect could have produced a rising incarceration trend as much as 71% shallower in the absence of GVC integration.[7]

## 6. Discussion and conclusion

Our study represents the first systematic analysis of how GVCs interact with ethnic polarization to increase incarceration rates in rich democracies. Drawing insights from the rich literature on the impact of GVCs on rich democracies, we argue that GVCs are an important macrostructural factor that moderates the relationship between ethnic polarization and carceral responses in these contexts. Consistent with our theoretical expectations, we find that increases in ethnic polarization are associated with larger increases in incarceration rates when countries are more deeply embedded in GVCs. This moderating effect is not only statistically robust, but also substantively meaningful. The carceral effect of ethnic polarization more than doubles from low to high levels of GVC integration (Fig. 1), and would have produced a nearly three and a half times shallower rise in incarceration in the absence of GVC integration (Fig. 2).

Our findings contribute to ongoing debates in criminology by clarifying how broader economic structures can amplify the association between ethnic polarization and incarceration. While minority threat theory posits that dominant groups respond to perceived threats with heightened control, few studies have systematically examined the institutional and structural conditions that shape this process (Feldmeyer & Cochran, 2018; but see Davis et al., 2022). Our study identifies GVC integration as a macrostructural condition that intensifies the polarization–threat–punishment nexus. We argue that ethnic polarization is more likely to be perceived as threatening—and minorities more readily framed as economic, political, or criminal threats—when GVC integration produces economic insecurity, fuels exclusionary political narratives, exacerbates intergroup competition, and erodes egalitarian institutions that might otherwise moderate ethnic conflict.

We further advance criminological theory by providing novel empirical evidence that the relationship between ethnic polarization and incarceration depends on the broader social context. Indeed, our results suggest that ethnic polarization may have a much more muted impact on incarceration in the absence of reductions in support for non-punitive alternatives to incarceration (e.g., welfare or labor protections), or increases in overall political conditions more favorable to incarceration, that make ethnic minorities more vulnerable to reaction forms of incarceration. That is, the impact of ethnic polarization depends on the broader macrostructural environments in which it occurs.

Theoretically, our findings also highlight the importance of macro-level transnational structural changes in shaping domestic penal

[7] One reviewer queried our ability to explain the observed variance in incarceration rates with the models reported. Of particular interest in light of our substantive focus on the moderating effect of GVCs is the change in explained variance between the baseline model, and those including ethnic polarization and its interaction with GVCs. The within-case R-square from the estimator reported in Model 3 of Table 4 of the baseline model is 0.398. Adding ethnic polarization increases this by ~17.3% to 0.467. Adding both ethnic polarization and its interaction with GVCs increases the within-case R-square by ~47.0% to 0.585.

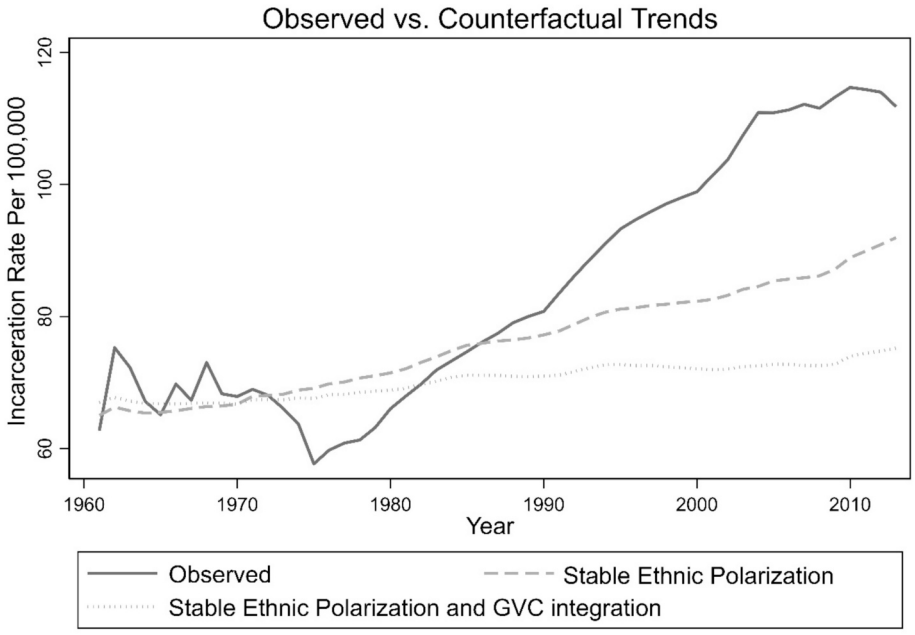



**Fig. 2.** Counterfactual Incarceration Trends Under Stable Ethnic Polarization, and Stable Ethnic Polarization and Global South Imports.

processes. Despite long-standing calls to embed punishment within global frameworks (Sparks, 2003), criminological research has rarely examined how transnational forces—such as globalization—interact with domestic processes to affect penal outcomes. Our study helps fill this gap by demonstrating that GVCs, as a key transnational economic arrangement, interact with domestic factors like ethnic polarization to shape carceral responses. We argue that structural shifts linked to global capitalism play a central role in how racial and ethnic differences are perceived and politicized. While recent research has explored how domestic institutions condition threat perceptions (Davis et al., 2022), few have considered the role of global economic forces. Historically, in the post–Civil War U.S. South, legislative measures such as vagrancy laws and convict leasing were used to manage labor market disruptions and economic threats perceived from racial and ethnic minorities, illustrating how shifts in economic structures can amplify perceptions of minority threat—a dynamic that we argue continues under contemporary GVC integration. Our results highlight the need for greater attention to the intersections of racial politics, economic globalization, and penal governance.

Empirically, our study contributes to the relatively limited body of cross-national research on minority threat and incarceration. Prior studies have reported mixed findings on the relationship between ethnic composition and incarceration, in part due to variation in how composition is measured. Building on recent advances in the literature (Marier & Cochran, 2023), we employ a measure of ethnic composition that more closely aligns with the theoretical premises of minority threat theory—specifically, one that captures the distribution of ethnic groups relative to one another. Additionally, our study is also among the first to examine the dynamic relationship between ethnic polarization and incarceration in a cross-national panel framework. As Chiricos et al. (2020) emphasize, one important refinement in conceptualizing group threat is to focus on demographic change over time, rather than static group composition. We follow this approach by using a robust fixed-effects design, which allows us to examine within-country changes and better account for country-level unobserved, time-invariant confounders. Finally, and most importantly, we suggest that previous inconsistencies may reflect the heterogenous relationship between ethnic polarization and incarceration. By incorporating country-level exposure to GVCs, we offer a more nuanced account of how structural conditions shape the threat-punishment link.

Nevertheless, our study has several limitations that warrant consideration. First, although we employ the ethnic polarization index—which aligns more closely with the theoretical assumptions of minority threat theory to measure ethnic composition, this measure is not without shortcomings. As Steele et al. (2022) note, the index does not account for the social or cultural distance between groups and assumes a uniform in-group affinity of 1. To address this concern, we tested the robustness of our results using an alternative and widely used measure: the ethnic fractionalization index, but future research might revisit these results in light of additional indicators of this concept. Second, our analysis does not disentangle the specific mechanisms through which GVCs moderate the relationship between ethnic polarization and incarceration. For example, we do not examine whether GVCs affect the formation of threat perceptions in response to polarization, or whether they shape the institutional and political translation of perceived threat into punitive outcomes. Nor do we directly measure threat perceptions, or test how GVCs may influence public or elite narratives around crime and minorities. While existing research suggests that threat can operate through multiple channels, we cannot determine by which pathways GVCs moderate the carceral effect of ethnic polarization. Future work can and should investigate such mechanisms by incorporating measures of perceived minority threat and racial or ethnic resentment drawn from survey data, as well as innovative measures of threat narratives based on text data (e.g., Duxbury, 2023), to more directly capture conflict generation and threat activation. In addition, future studies could examine the institutional pathways by using measures of welfare state generosity and union density, and by testing whether punitive attitudes toward criminal justice are jointly shaped by ethnic polarization and GVC integration.

Relatedly, our aggregate incarceration outcome captures diffuse rather than targeted minority threat. Future studies could examine whether and how GVCs interact with minority threat to amplify carceral responses toward specific racial or ethnic groups using group-disaggregated outcomes.

Third, our analysis is limited to rich democracies. A common critique of minority threat research is its neglect of developing countries (Davis & Gibson-Light, 2020), often due to data constraints. However, our theoretical scope is intentionally focused on rich democracies, where the political-economic mechanisms through which GVCs operate—such as labor market restructuring and welfare state retrenchment—are well-

documented. The impact of GVCs in developing countries may follow different pathways—and even work in different directions. Thus, extending this research to those contexts would be a fruitful direction for future work to assess. Finally, we rely on incarceration rates as our primary measure of formal social control. While incarceration is a consequential and widely used indicator, future studies could explore other forms of state control, such as arrest rates, pre-trial detention, or sentencing severity, to better capture the multifaceted nature of punitive responses.

In conclusion, our study highlights the crucial role of macrostructural context in shaping the carceral responses to ethnic polarization. By integrating minority threat with the literature on the socio-economic effect of GVCs in rich democracies, we show that punitive reactions to polarization depend on broader institutional and economic conditions. Global value chain integration emerges as a key macrostructural factor that transforms the dynamics of ethnic polarization and punishment. These findings point to the need for a more comprehensive theory of punishment—one that recognizes how domestic social and political factors interact with global economic restructuring to shape penal policies and outcomes.

## CRediT authorship contribution statement

**Manjing Gao:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Sharon S. Oselin:** Writing – review & editing, Supervision, Project administration, Funding acquisition. **Matthew C. Mahutga:** Writing – review & editing, Visualization, Supervision, Methodology, Funding acquisition, Data curation, Conceptualization.

## Declaration of competing interest

The authors report there are no competing interests to declare.

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