Economic Shocks and Crime: Evidence from the Brazilian Trade Liberalization

Rafael Dix-Carneiro, Rodrigo R. Soares and Gabriel Ulyssea*

Online Appendix

A Import Tariffs

Tariff data come from Kume et al. (2003), who report nominal tariffs and effective rates of protection from 1987 to 1998 using the Brazilian industry classification Nível 50. We aggregate these tariffs slightly to an industry classification that is consistent with the Demographic Census data used to construct local tariff shock measures. The classification is presented in Table A1 of Dix-Carneiro and Kovak (2017b). In aggregating, we weight each Nível 50 industry by its 1990 industry value added, as reported in IBGE National Accounts data. Figure A.1 shows the evolution of nominal tariffs from 1987 to 1998 for the ten largest industries. The phases of Brazilian liberalization are visible – see Section 2 of Dix-Carneiro and Kovak (2017b) for a discussion and citations). Large nominal tariff cuts from 1987-1989 had little effect on protection, due to the presence of substantial nontariff barriers and tariff exemptions. In 1990, the majority of nontariff barriers and tariff exemptions were abolished, being replaced by tariffs providing equivalent protection; note the increase in tariffs in some industries in 1990. During liberalization, from 1990 to 1994, tariffs fell in all industries, then were relatively stable from 1995 onward.

*Dix-Carneiro: Department of Economics, Duke University, 210A, Social Sciences Building, Durham, NC 27708 (email: rafael.dix.carneiro@duke.edu); Soares: Columbia University, 420 W. 118th Street, New York, NY 10027 and Sao Paulo School of Economics-FGV (email: r.soares@columbia.edu); Ulyssea: PUC-Rio, R. Marques de Sao Vicente, 225, Rio de Janeiro, RJ 22451-900 (email: ulyssea@econ.puc-rio.br).

Figure A.1: Evolution of Trade Tariffs per Industry

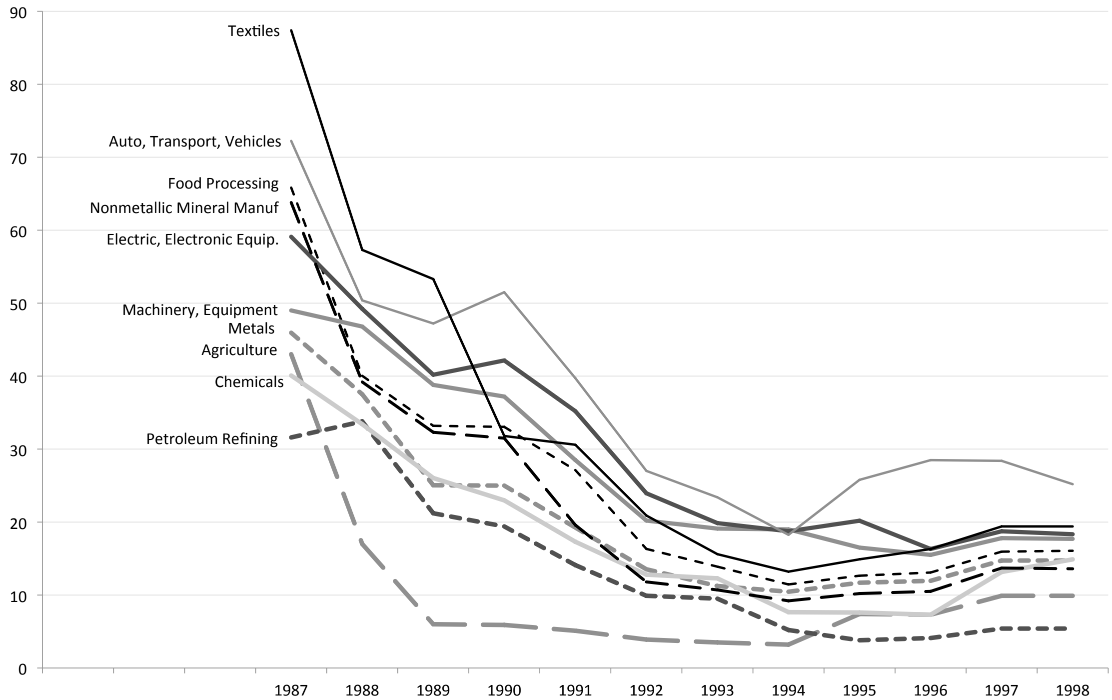


Figure A.2: Source: Dix-Carneiro and Kovak (2017b)

B Tariff Changes after 1995

This paper treats the 1990-1995 changes in tariffs induced by the trade liberalization as a once-and-for-all shock. Indeed, changes in tariffs after 1995 are trivial relative to the changes that occurred between 1990 and 1995. This section provides evidence supporting this claim.

The data on tariffs used in the paper are from Kume et al. (2003). These data have been extensively used by previous papers in the literature on trade and labor markets in Brazil.[1] However, these data only cover the period 1987-1998. In order to show how post-liberalization tariff changes relate to changes induced by the trade reform, we use data from UNCTAD TRAINS, which cover the entire period from 1990 to 2010. Equipped with these data, we compute regional tariff changes using sectoral tariff changes between 1990 and 1995 ($RTC_{r,90-95}$), 1990 and 2000 ($RTC_{r,90-00}$) and 1990 and 2010 ($RTC_{r,90-10}$). Table B.1 shows that regional tariff changes over longer horizons, $RTC_{r,90-00}$ and $RTC_{r,90-10}$, are almost perfectly correlated with $RTC_{r,90-95}$ (elasticities are all larger than 0.8 and R-squared's are all larger than 0.92). This implies that changes in tariffs between 1990 and 1995 can indeed be considered as permanent without substantially affecting any of our qualitative or quantitative results.

[1]See Menezes-Filho and Muendler (2011), Kovak (2013), Dix-Carneiro and Kovak (2015), Dix-Carneiro and Kovak (2017b), Dix-Carneiro and Kovak (2017a), and Hirata and Soares (2015).

Table B.1: Regional Tariff Changes 1990-1995 vs. Regional Tariff Changes 1990-2000 and 1990-2010

Dep. Var.:	$RTC_{r,90-00}$ (1)	$RTC_{r,90-00}$ (2)	$RTC_{r,90-10}$ (3)	$RTC_{r,90-10}$ (4)
$RTC_{r,90-95}$	0.970***	0.985***	0.844***	0.802***
	(0.00359)	(0.00311)	(0.0113)	(0.0114)
Observations Weighted By Population	No	Yes	No	Yes
Observations	411	411	411	411
R-squared	0.994	0.996	0.931	0.923

Notes: Regional Tariff Changes (RTC_r) over different horizons computed from UNCTAD TRAINS data. $RTC_{r,90-95}$ uses changes in sectoral tariffs between 1990 and 1995; $RTC_{r,90-00}$ uses changes in sectoral tariffs between 1990 and 2000; and $RTC_{r,90-10}$ uses changes in sectoral tariffs between 1990 and 2010. UNCTAD TRAINS tariffs at the product level were aggregated into 44 industries compatible with the 1991 Brazilian Demographic Census. Aggregation was performed using simple averages. These industry-level tariffs were then used in the calculation of RTC_r. Standard errors in parentheses.
Significant at the *** 1 percent, ** 5 percent, and * 10 percent level.

C Homicide Rates as a Proxy for Overall Criminal Activity

This section investigates to what extent local homicide rates constitute a good proxy for overall criminal activity. We examine data from Minas Gerais and São Paulo, the two most populous states in Brazil, which account for 32 percent of Brazil's total population. These constitute the very few Brazilian states publishing disaggregate crime data from police-compiled statistics since the early 2000s at the municipality level. We have data for four types of crime: homicides recorded by the health system (our dependent variable), homicides recorded by the police, violent crimes against the person (excluding homicides), and violent property crimes. Violent property crimes refer to robberies in both states. Violent crimes against the person refer to rape in São Paulo and to rape, assaults, and attempted homicides in Minas Gerais. The data are provided by the statistical agencies of the two states (Fundação SEADE for São Paulo and Fundação João Pinheiro for Minas Gerais).

We start by examining how the rates of different types of crime recorded by the police correlate with the homicide rates used in our empirical analysis for a 5-year interval. As Table C.1 shows, our measure of homicides is highly correlated, both in levels and in changes, to police-recorded homicides, to property crimes, and to crimes against the person.

Table C.2 shows the results in log-levels for both São Paulo and Minas Gerais using yearly data and 10-year intervals. Table C.3 shows correlations for log-changes for both states and the same time intervals. Homicide rates measured by the police and the health system are highly correlated, with a strongly significant correlation that ranges from 0.84 to 0.92. Both measures of homicides are also strongly and significantly correlated with crimes against the person and property crimes, but particularly so with the latter. It is worth noting that the correlations in Panel B of Table C.3 should be interpreted with caution given the small number of observations used to generate them.

Tables C.4 and C.5 relate our measure of homicide rates (from the health system) to the rates of crimes against the person, property crimes and homicides measured by the police. These regressions control for micro-region and year fixed effects, so we focus on how changes in our measure of criminal activity, relative to aggregate crime trends, relate to changes in other measures of crime within regions. The first three columns show results in line with those from Tables C.1, C.2 and C.3. Even after we account for micro-region fixed effects and common trends in crime, homicide rates measured by the health system are strongly correlated with homicides recorded by the police, crimes against the person, and property crimes. Moreover, these correlations are stronger when we restrict attention to longer time windows. Columns 4 and 5 progressively include the different measures of crime rates on the right hand side.

In sum, Table C.1 and the results presented in this section indicate that local homicide rates measured by the health system (DATASUS) are indeed systematically correlated with local overall crime rates recorded by the police.

Table C.1: Correlation Between Homicide Rates And Other Crime Measures: Micro-Regions of São Paulo and Minas Gerais, 5-year intervals (2001, 2006 and 2011)

Log-Levels				
	$\log(CR_r)$	$\log(HomPol_r)$	$\log(Person_r)$	$\log(Property_r)$
São Paulo				
$\log(CR_r)$	1			
$\log(HomPol_r)$	0.849***	1		
$\log(Person_r)$	0.204***	0.223***	1	
$\log(Property_r)$	0.611***	0.490***	0.286***	1
Observations		186		
Minas Gerais				
$\log(CR_r)$	1			
$\log(HomPol_r)$	0.889***	1		
$\log(Person_r)$	0.580***	0.711***	1	
$\log(Property_r)$	0.716***	0.644***	0.633***	1
Observations		192		

Log-Changes				
	$\Delta_5 \log(CR_r)$	$\Delta_5 \log(HomPol_r)$	$\Delta_5 \log(Person_r)$	$\Delta_5 \log(Property_r)$
São Paulo				
$\Delta_5 \log(CR_r)$	1			
$\Delta_5 \log(HomPol_r)$	0.700***	1		
$\Delta_5 \log(Person_r)$	0.513***	0.483***	1	
$\Delta_5 \log(Property_r)$	0.348***	0.415***	0.455***	1
Observations		124		
Minas Gerais				
$\Delta_5 \log(CR_r)$	1			
$\Delta_5 \log(HomPol_r)$	0.675***	1		
$\Delta_5 \log(Person_r)$	0.435***	0.359***	1	
$\Delta_5 \log(Property_r)$	0.393***	0.294***	0.783***	1
Observations		128		

Notes: Data are provided by the statistical agencies of the two states (Fundação SEADE for São Paulo and Fundação João Pinheiro for Minas Gerais. Observations are weighted by region-specific population. CR_r is the homicide rate measured by the health system (DATASUS), $HomPol_r$ is the homicide rate measured by the police, $Person_r$ is the rate of crimes against the person, and $Property_r$ is the rate of property crimes. Notation: $\Delta_s y = y_{t+s} - y_t$..
Significant at the *** 1 percent, ** 5 percent, and * 10 percent level.

Table C.2: Correlation Between Homicide Rates And Other Crime Measures: Micro-Regions of São Paulo and Minas Gerais, 2000–2010

Panel A: Yearly data				
	$\log(CR_r)$	$\log(HomPol_r)$	$\log(Person_r)$	$\log(Property_r)$
São Paulo				
$\log(CR_r)$	1			
$\log(HomPol_r)$	0.884***	1		
$\log(Person_r)$	0.371***	0.376***	1	
$\log(Property_r)$	0.633***	0.542***	0.329***	1
Observations		682		
Minas Gerais				
$\log(CR_r)$	1			
$\log(HomPol_r)$	0.916***	1		
$\log(Person_r)$	0.658***	0.740***	1	
$\log(Property_r)$	0.733***	0.652***	0.613***	1
Observations		704		

Panel B: 10-year intervals (2001 and 2011)				
São Paulo				
$\log(CR_r)$	1			
$\log(HomPol_r)$	0.844***	1		
$\log(Person_r)$	0.0793	0.0138	1	
$\log(Property_r)$	0.614***	0.460***	0.299***	1
Observations		124		
Minas Gerais				
$\log(CR_r)$	1			
$\log(HomPol_r)$	0.859***	1		
$\log(Person_r)$	0.518***	0.687***	1	
$\log(Property_r)$	0.723***	0.645***	0.623***	1
Observations		128		

Notes: Data are provided by the statistical agencies of the two states (Fundação SEADE for São Paulo and Fundação João Pinheiro for Minas Gerais). Observations are weighted by region-specific population. CR_r is the homicide rate measured by the health system (DATASUS), $HomPol_r$ is the homicide rate measured by the police, $Person_r$ is the rate of crimes against the person, and $Property_r$ is the rate of property crimes.

Significant at the *** 1 percent, ** 5 percent, and * 10 percent level.

Table C.3: Correlation Between Log-Changes in Homicide Rates and Other Crime Measures: Micro-Regions of São Paulo and Minas Gerais, 2000–2010

Panel A: Yearly data				
	$\Delta_1 \log(CR_r)$	$\Delta_1 \log(HomPol_r)$	$\Delta_1 \log(Person_r)$	$\Delta_1 \log(Property_r)$
São Paulo				
$\Delta_1 \log(CR_r)$	1			
$\Delta_1 \log(HomPol_r)$	0.586***	1		
$\Delta_1 \log(Person_r)$	0.257***	0.338***	1	
$\Delta_1 \log(Property_r)$	0.147***	0.153***	0.139***	1
Observations		620		
Minas Gerais				
$\Delta_1 \log(CR_r)$	1			
$\Delta_1 \log(HomPol_r)$	0.621***	1		
$\Delta_1 \log(Person_r)$	0.163***	0.130***	1	
$\Delta_1 \log(Property_r)$	0.229***	0.188***	0.400***	1
Observations		640		

Panel B: 10-year intervals (2001 and 2011)				
	$\Delta_{10} \log(CR_r)$	$\Delta_{10} \log(HomPol_r)$	$\Delta_{10} \log(Person_r)$	$\Delta_{10} \log(Property_r)$
São Paulo				
$\Delta_{10} \log(CR_r)$	1			
$\Delta_{10} \log(HomPol_r)$	0.755***	1		
$\Delta_{10} \log(Person_r)$	0.569***	0.0595	1	
$\Delta_{10} \log(Property_r)$	0.478***	0.382***	0.290**	1
Observations		62		
Minas Gerais				
$\Delta_{10} \log(CR_r)$	1			
$\Delta_{10} \log(HomPol_r)$	0.478***	1		
$\Delta_{10} \log(Person_r)$	0.259**	0.196	1	
$\Delta_{10} \log(Property_r)$	0.308**	0.115	0.154	1
Observations		64		

Notes: Data are provided by the statistical agencies of the two states (Fundação SEADE for São Paulo and Fundação João Pinheiro for Minas Gerais). Observations are weighted by region-specific population. CR_r is the homicide rate measured by the health system (DATASUS); $HomPol_r$ is the homicide rate measured by the police; $Person_r$ is the rate of crimes against the person; and $Property_r$ is the rate of property crimes. Notation: $\Delta_s y = y_{t+s} - y_t$.
Significant at the *** 1 percent, ** 5 percent, and * 10 percent level.

Table C.4: Conditional Correlations between Homicide Rates and Other Crime Rates: Micro-Regions of São Paulo, 2000–2010

Panel A: Yearly Data

Dep. Var.: $\log(CR_r)$	(1)	(2)	(3)	(4)	(5)
$\log(Person_r)$	0.313***			0.285***	0.279***
	(0.0444)			(0.0498)	(0.0532)
$\log(Property_r)$		0.613***		0.565***	0.178***
		(0.149)		(0.147)	(0.0620)
$\log(HomPol_r)$			0.482***		0.448***
			(0.0444)		(0.0341)
Observations	682	682	682	682	682
R^2 Within	0.743	0.746	0.845	0.772	0.875
R^2 Between	0.474	0.681	0.830	0.758	0.902

Panel B: 5-year intervals (2000, 2005 and 2010)

Dep. Var.: $\log(CR_r)$	(1)	(2)	(3)	(4)	(5)
$\log(Person_r)$	0.451***			0.400***	0.391***
	(0.0712)			(0.0799)	(0.0543)
$\log(Property_r)$		0.638***		0.467***	0.0877
		(0.192)		(0.170)	(0.0995)
$\log(HomPol_r)$			0.456***		0.426***
			(0.0561)		(0.0403)
Observations	186	186	186	186	186
R^2 Within	0.762	0.728	0.845	0.779	0.898
R^2 Between	0.458	0.657	0.799	0.736	0.855

Panel C: 10-year intervals (2000 and 2010)

Dep. Var.: $\log(CR_r)$	(1)	(2)	(3)	(4)	(5)
$\log(Person_r)$	0.552***			0.455***	0.490***
	(0.116)			(0.133)	(0.0491)
$\log(Property_r)$		1.023***		0.732***	0.131
		(0.288)		(0.267)	(0.115)
$\log(HomPol_r)$			0.466***		0.431***
			(0.0615)		(0.0357)
Observations	124	124	124	124	124
R^2 Within	0.820	0.795	0.887	0.849	0.960
R^2 Between	0.316	0.684	0.721	0.710	0.782

Notes: Data from Fundação SEADE. 62 micro-regions in the State of São Paulo. Robust standard errors in parentheses (clustered at the micro-region level). All regressions control for micro-regions and year fixed effects. CR_r is the homicide rate measured by the health system (DATASUS), $HomPol_r$ is the homicide rate measured by the police, $Person_r$ is the rate of violent crimes against the person, and $Property_r$ is the rate of property crimes. Violent property crimes refer to robberies, violent crimes against the person refer to rape.

Significant at *** 1 percent, ** 5 percent, and * 10 percent.

Table C.5: Conditional Correlations between Homicide Rates and Other Crime Rates: Micro-Regions of Minas Gerais, 2000–2010

Panel A: Yearly Data

Dep. Var.: $\log(CR_r)$	(1)	(2)	(3)	(4)	(5)
$\log(Person_r)$	0.280***			0.158**	0.0588
	(0.0710)			(0.0652)	(0.0479)
$\log(Property_r)$		0.305***		0.292***	0.214***
		(0.0983)		(0.0891)	(0.0628)
$\log(HomPol_r)$			0.751***		0.706***
			(0.0527)		(0.0450)
Observations	703	704	704	703	703
R^2 Within	0.286	0.306	0.537	0.325	0.566
R^2 Between	0.625	0.200	0.792	0.402	0.857

Panel B: 5-year intervals (2000, 2005 and 2010)

Dep. Var.: $\log(CR_r)$	(1)	(2)	(3)	(4)	(5)
$\log(Person_r)$	0.320**			0.260*	0.157
	(0.133)			(0.138)	(0.117)
$\log(Property_r)$		0.252**		0.179*	0.205***
		(0.103)		(0.101)	(0.0736)
$\log(HomPol_r)$			0.713***		0.693***
			(0.0863)		(0.0765)
Observations	192	192	192	192	192
R^2 Within	0.544	0.537	0.667	0.553	0.692
R^2 Between	0.486	0.194	0.656	0.498	0.726

Panel C: 10-year intervals (2000 and 2010)

Dep. Var.: $\log(CR_r)$	(1)	(2)	(3)	(4)	(5)
$\log(Person_r)$	0.335*			0.278	0.178
	(0.191)			(0.176)	(0.162)
$\log(Property_r)$		0.392**		0.348*	0.304**
		(0.184)		(0.174)	(0.139)
$\log(HomPol_r)$			0.638***		0.567***
			(0.156)		(0.152)
Observations	128	128	128	128	128
R^2 Within	0.634	0.646	0.696	0.663	0.729
R^2 Between	0.428	0.247	0.535	0.446	0.673

Notes: Data from Fundação João Pinheiro. 64 micro-regions in the State of Minas Gerais. Robust standard errors in parentheses (clustered at the micro-region level). All regressions control for micro-regions and year fixed effects. CR_r is the homicide rate measured by the health system (DATASUS), $HomPol_r$ is the homicide rate measured by the police, $Person_r$ is the rate of violent crimes against the person, and $Property_r$ is the rate of property crimes. Property crimes refer to robberies, crimes against the person refer to rape, assaults, and attempted homicides.
Significant at *** 1 percent, ** 5 percent, and * 10 percent.

D Data Procedures

D.1 Regional Employment and Earnings Net of Compositional Effects

Changes in our regional employment and earnings variables are net of composition, so that changes in these variables reflect changes in regional labor market conditions for observationally equivalent individuals and do not reflect changes in composition. This section describes how we use individual-level Census data to compute region-specific log earnings and employment rates netting out compositional effects.

We obtain region- and year-specific log-earnings by estimating the Mincer regression below and saving the $\widehat{\omega}_{rs}$ estimates:

$$\begin{aligned} \log\left(w_{irs}\right) &= \omega_{rs} + \sum_{k} \eta^{w}_{ks} I\left(Educ_i = k\right) + \gamma^{w}_{s} I\left(Female_i = 1\right) + \\ &\quad \delta^{w}_{1s}\left(age_{is} - 18\right) + \delta^{w}_{2s}\left(age_{is} - 18\right)^2 + \varepsilon^{w}_{irs}, \end{aligned} \tag{1}$$

where w_{irs} represents *total* monthly labor market earnings for worker i in region r in year s, $I\left(Educ_i = k\right)$ is a dummy variable corresponding to years of schooling k, $I\left(Female_i = 1\right)$ is a dummy for gender, age_{is} indicates age, and ω_{rs} captures the average of the log of monthly earnings net of composition in region r and time period s. Finally, ε^{w}_{irs} is an error term. We use $\widehat{\omega}_{rs}$ as our measure of log-earnings in region r in year s.

Region- and year-specific employment rates are obtained in a similar fashion, by estimating the linear probability model below and saving the $\widehat{\pi}_{rs}$ estimates:

$$\begin{aligned} Emp_{irs} &= \pi_{rs} + \sum_{k} \eta^{e}_{ks} I\left(Educ_i = k\right) + \gamma^{e}_{s} I\left(Female_i = 1\right) + \\ &\quad \delta^{e}_{1s}\left(age_{is} - 18\right) + \delta^{e}_{2s}\left(age_{is} - 18\right)^2 + \varepsilon^{e}_{irs}, \end{aligned} \tag{2}$$

where Emp_{irs} indicates if individual i in region r was employed in year s, π_{rs} captures the average probability of employment net of composition in region r and time period s, and ε^{e}_{irs} is an error term. We use $\widehat{\pi}_{rs}$ as our measure of the employment rate in region r in year s.

D.2 Employment Rates

The question in the Census questionnaire regarding work status changed between 1991 and 2000, remaining the same in 2010. In 1991 the question was "Have you worked in all or part of the past 12 months?", while in 2000 and 2010 the question related to the surveys' reference week. There is no widely used procedure to make these questions comparable, so we adopt the following strategy to construct a comparable variable across Censuses' waves.

In 1991 we define $Emp_{irt} = 1$ if the individual answers yes to "Have you worked in all or part of the previous 12 months?" and zero otherwise. For 2000 and 2010, we define $Emp_{irt} = 1$ if: (a) the individual worked for pay in the reference week; or (b) the individual had a job during the reference week, but for some reason did not work that week; or (c) the individual helped (without pay) a household member in her job or was an intern or apprentice; or (d) the individual helped (without pay) a household member engaged in agricultural activities; or (e) the individual worked in agricultural activities to supply food to household members; and $Emp_{irt} = 0$ otherwise. The answer "yes" to the 1991 question embeds all of the cases above.

E Additional Results

E.1 Local Trade Shocks and Crime Rates: Robustness

In this Section we conduct robustness tests for the results presented in Tables **??** and **??**. We estimate the specifications shown in column 3 of these tables and sequentially control for initial region characteristics such as pre-trends in crime rates (1980-1991) and 1991 levels of the following socio-demographic variables: household per-capita income inequality, employment rate, share of males, share of young (less than 30 years old), share of unskilled, share of manufacturing and share of population in urban areas. Tables E.1 and E.2 show the results for the medium- (1991–2000) and long-run (1991–2010) specifications, respectively.

It is important to note that, given that RTC_r exploits variation across regions in 1991 industry mix, many of these variables – especially share of unskilled, urbanization rate and share of manufacturing – are highly correlated with the local trade shock. This leads to variance inflation factors (VIF) on RTC_r larger than 10, indicating multi-collinearity problems.[2] Therefore, results in columns 6-8 in Tables E.1 and E.2 should be interpreted with caution given that the addition of any of these three variables absorb over 96% of the variation in RTC_r. Nonetheless, the results are robust to the inclusion of these variables – perhaps with the exception of column 8 – for the medium run – where the response becomes non-significant due to a large standard error.

[2]The Variance Inflation Factor (VIF) on RTC_r is defined as $1/(1 - R^2)$ where R^2 is the R^2 of a regression of RTC_r on the remaining explanatory variables (including state-year fixed effects). Although there are no formal tests for detecting multicollinearity, the statistics literature issues a note of warning if the VIF is higher than 5 or 10. Neter et al. (1989) state "A maximum VIF value in excess of 10 is often taken as an indication that multi-collinearity may be unduly influencing the least square estimates." Hair et al. (1995) suggest that a VIF of less than 10 are indicative of inconsequential collinearity. Marquardt (1970) uses a VIF greater than 10 as a guideline for serious multi-collinearity.

Table E.1: Regional Tariff Changes and Log-Changes in Local Crime Rates – Robustness to Socio-Demographic Controls: 1991– 2000

Dep. Variable: $\Delta_{91-00}\log(CR)$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RTC_r	-3.769***	-3.260***	-3.454***	-2.717**	-4.099***	-3.052*	-5.141***	-2.964
	(1.365)	(1.187)	(1.171)	(1.203)	(1.461)	(1.566)	(1.893)	(2.331)
Pre-Trend $\Delta_{80-91}\log(CR)$	-0.303***	-0.311***	-0.315***	-0.321***	-0.323***	-0.324***	-0.318***	-0.320***
	(0.0749)	(0.0777)	(0.0751)	(0.0745)	(0.0737)	(0.0742)	(0.0743)	(0.0745)
Share Employment (1991)		2.332**	2.373**	2.392**	2.681**	2.783**	3.049***	2.826**
		(1.072)	(1.089)	(1.107)	(1.078)	(1.066)	(1.109)	(1.242)
Gini (1991)			-0.842	-1.168	-0.652	-1.084	-1.643	-1.927*
			(0.761)	(0.807)	(0.976)	(1.003)	(1.148)	(1.127)
Share Male (1991)				-4.218	-2.994	-1.162	-0.322	-0.856
				(5.201)	(5.268)	(5.617)	(5.478)	(5.574)
Share Young (1991)					-4.197	-3.502	-3.665	-3.864
					(3.539)	(3.558)	(3.497)	(3.190)
Share Unskilled (1991)						-2.063	-1.112	-1.359
						(1.612)	(1.592)	(1.435)
Share Manufacturing (1991)							-3.080	-2.717
							(2.097)	(2.141)
Share Urban (1991)								0.591*
								(0.331)
Observations	411	411	411	411	411	411	411	411
R-squared	0.406	0.416	0.417	0.419	0.423	0.426	0.431	0.437
Variance Inflation Factor for RTC_r	1.768	2.009	2.177	5.338	9.589	12.33	19.61	27.49

Notes: Decennial Census data. Standard errors (in parentheses) adjusted for 91 meso-region clusters. Unit of analysis r is a micro-region. Observations are weighted by population. All specifications control for state-period fixed effects.
Significant at the *** 1 percent, ** 5 percent, * 10 percent level.

Table E.2: Regional Tariff Changes and Log-Changes in Local Crime Rates – Robustness to Socio-Demographic Controls: 1991– 2010

Dep. Variable: $\Delta_{91-00}\log(CR)$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RTC_r	-1.198	-0.807	-1.236	-0.588	-1.636	0.521	-4.416	0.0952
	(2.265)	(2.160)	(2.132)	(2.237)	(2.199)	(2.258)	(3.393)	(3.098)
Pre-Trend $\Delta_{80-91}\log(CR)$	-0.514***	-0.521***	-0.531***	-0.536***	-0.537***	-0.541***	-0.526***	-0.529***
	(0.0902)	(0.0918)	(0.0884)	(0.0869)	(0.0874)	(0.0879)	(0.0823)	(0.0794)
Share Employment (1991)		1.808	1.911	1.932	2.150*	2.373*	3.005**	2.534**
		(1.352)	(1.327)	(1.322)	(1.257)	(1.247)	(1.356)	(1.220)
Gini (1991)			-1.853*	-2.137*	-1.739	-2.637**	-3.979***	-4.552***
			(0.956)	(1.100)	(1.072)	(1.177)	(1.192)	(1.168)
Share Male (1991)				-3.677	-2.714	1.211	3.056	2.031
				(7.285)	(7.584)	(8.021)	(7.616)	(7.473)
Share Young(1991)					-3.168	-1.767	-2.169	-2.559
					(3.905)	(4.391)	(4.102)	(3.406)
Share Unskilled (1991)						-4.322*	-2.036	-2.537
						(2.227)	(2.387)	(2.249)
Share Manufacturing (1991)							-7.284**	-6.516**
							(2.800)	(2.718)
Share Urban (1991)								1.234***
								(0.387)
Observations	411	411	411	411	411	411	411	411
R-squared	0.702	0.704	0.707	0.708	0.708	0.714	0.724	0.732
Variance Inflation Factor for RTC_r	1.755	1.991	2.087	5.234	8.727	12.06	18.47	25.84

Notes: Decennial Census data. Standard errors (in parentheses) adjusted for 91 meso-region clusters. Unit of analysis r is a micro-region. Observations are weighted by population. All specifications control for state-period fixed effects.
Significant at the *** 1 percent, ** 5 percent, * 10 percent level.

E.2 Dynamic Responses of other Variables

For completeness, this section shows the yearly evolution of the effect of RTC on the outcomes analyzed in Table **??** for which we have annual data – similar to what is done in Figure **??**. Note that the variables related to regional labor market conditions, inequality, public safety personnel, and high school dropouts can only be measured with Demographic Census data, every 10 years. Therefore, this exercise cannot be conducted for these variables.

Figures E.1, E.2, E.3, E.4, and E.5 show the evolution of the effect of RTC on government revenue, government spending, number of formal establishments, formal wage bill per capita, and suicide rates. Each point in these figures reflects an individual regression coefficient, $\widehat{\theta}_t$ following (**??**), where the independent variable is the regional tariff change (RTC_r) and $t = 1992, ..., 2010$ ($t = 1995, ..., 2010$ in Figures E.1 and E.2 as data before 1993 is unreliable – see Section **??**). Note that RTC_r always reflects tariff changes from 1990-1995. All regressions include state fixed effects and, as before, negative estimates imply positive variations in the dependent variable in regions facing larger tariff reductions. Dashed lines show 95 percent confidence intervals and the standard errors are adjusted for 91 mesoregion clusters.

Figure E.1: Dynamic Effects of Regional Tariff Changes on Local Governments' Revenue Per Capita

Figure E.2: Dynamic Effects of Regional Tariff Changes on Local Governments' Spending Per Capita

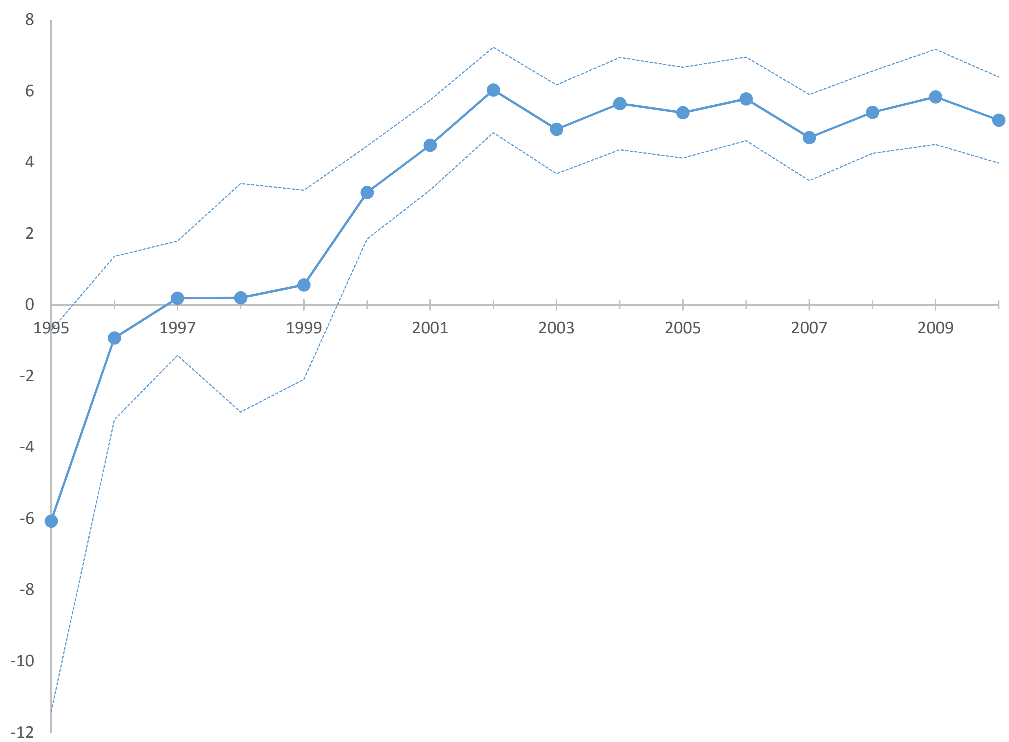


Figure E.3: Dynamic Effects of Regional Tariff Changes on the Number of Formal Plants

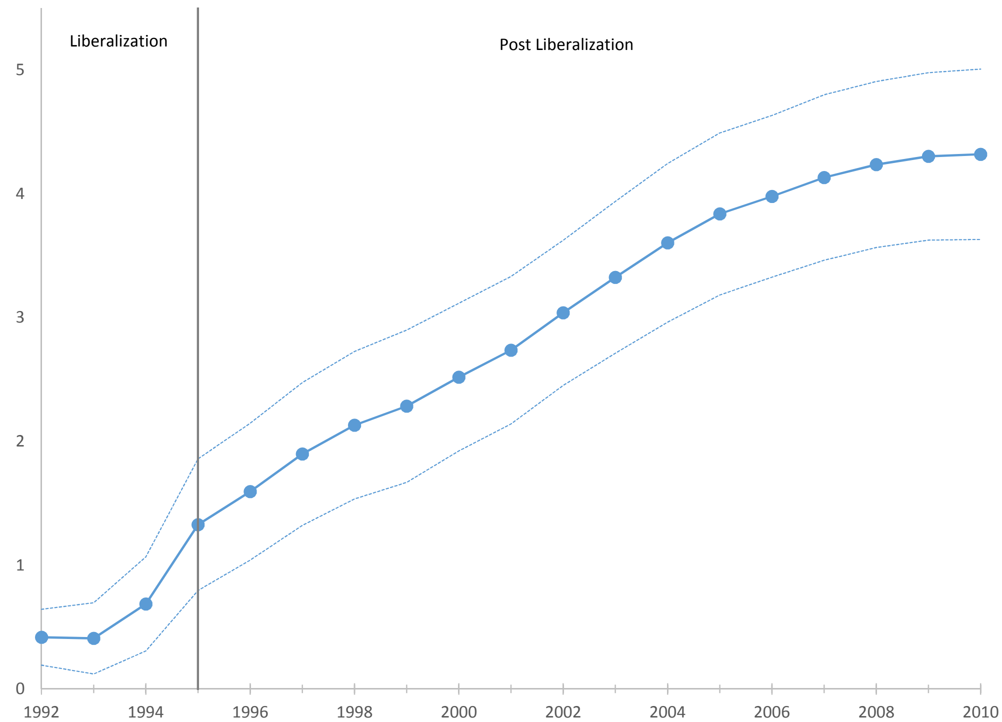
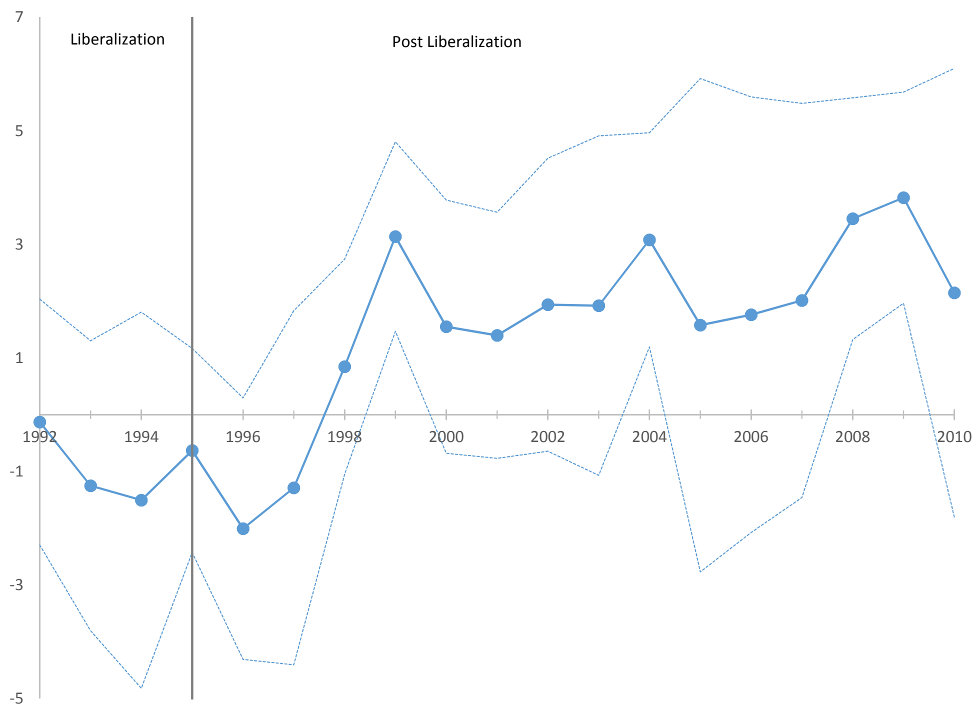


Figure E.4: Dynamic Effects of Regional Tariff Changes on the Formal Wage Bill Per Capita

Figure E.5: Dynamic Effects of Regional Tariff Changes on the Suicide Rates (per 100,000 inhabitants)



F Derivation of Bounds for β^e

Throughout this section, we will use the notation $Cone(\boldsymbol{v}_1, \boldsymbol{v}_2, ..., \boldsymbol{v}_n)$ to denote the cone spanned by vectors $\boldsymbol{v}_1$, $\boldsymbol{v}_2$, ... , $\boldsymbol{v}_n$, which consists of all **positive** linear combinations of these vectors. In section **??**, we obtained equation (**??**), which we reproduce below:

$$\begin{pmatrix} \theta_1 \\ \theta_2 \end{pmatrix} = \widetilde{\beta}^w \begin{pmatrix} -b_1^w \\ -b_2^w \end{pmatrix} + \widetilde{\beta}^e \begin{pmatrix} -b_1^e \\ -b_2^e \end{pmatrix} + \widetilde{\beta}^g \begin{pmatrix} -b_1^g \\ -b_2^g \end{pmatrix} + \widetilde{\beta}^{ps} \begin{pmatrix} -b_1^{ps} \\ -b_2^{ps} \end{pmatrix} + \widetilde{\beta}^h \begin{pmatrix} b_1^h \\ b_2^h \end{pmatrix} + \widetilde{\beta}^i \begin{pmatrix} b_1^i \\ b_2^i \end{pmatrix},$$

with $\widetilde{\boldsymbol{\beta}} \geq 0$, which means that $\boldsymbol{\theta}$ belongs to the cone spanned by vectors $-\mathbf{b}^w, -\mathbf{b}^e, -\mathbf{b}^g$, $-\mathbf{b}^{ps}, \mathbf{b}^h$ and $\mathbf{b}^i$ – which we denote $Cone\left(-\mathbf{b}^w, -\mathbf{b}^e, -\mathbf{b}^g, -\mathbf{b}^{ps}, \mathbf{b}^h, \mathbf{b}^i\right)$. This is a theoretical relationship on the true population parameters, but note that empirically:

$$\widehat{\boldsymbol{\theta}} \in Cone\left(-\widehat{\mathbf{b}}^w, -\widehat{\mathbf{b}}^e, -\widehat{\mathbf{b}}^g, -\widehat{\mathbf{b}}^{ps}, \widehat{\mathbf{b}}^h, \widehat{\mathbf{b}}^i\right) = Cone\left(-\widehat{\mathbf{b}}^e, \widehat{\mathbf{b}}^h\right),$$

where the last equality follows from

$$\left\{-\widehat{\mathbf{b}}^w, -\widehat{\mathbf{b}}^g, -\widehat{\mathbf{b}}^{ps}, \widehat{\mathbf{b}}^i\right\} \in Cone\left(-\widehat{\mathbf{b}}^e, \widehat{\mathbf{b}}^h\right).$$

However, $\widehat{\boldsymbol{\theta}} \notin Cone\left(-\widehat{\mathbf{b}}^w, \widehat{\mathbf{b}}^h\right)$ and $Cone\left(-\widehat{\mathbf{b}}^w, \widehat{\mathbf{b}}^h\right)$ is the largest cone spanned by

$$\left\{-\widehat{\mathbf{b}}^w, -\widehat{\mathbf{b}}^g, -\widehat{\mathbf{b}}^{ps}, \widehat{\mathbf{b}}^h, \widehat{\mathbf{b}}^i\right\}.$$

Also note from Figure **??** that any element $\mathbf{y} \in Cone\left(-\widehat{\mathbf{b}}^w, \widehat{\mathbf{b}}^h\right)$ has $\mathbf{y} < \mathbf{0}$. These relationships are based on **estimates**.

Based on these empirical results, we make the assumptions below, regarding **population** projection coefficients. These just reflect that we assume that the configuration of population vectors is similar to the configuration of estimated vectors.

Assumption 1 $\boldsymbol{\theta} \in Cone\left(-\mathbf{b}^w, -\mathbf{b}^e, -\mathbf{b}^g, -\mathbf{b}^{ps}, \mathbf{b}^h, \mathbf{b}^i\right)$

Assumption 2 $Cone\left(-\mathbf{b}^w, -\mathbf{b}^e, -\mathbf{b}^g, -\mathbf{b}^{ps}, \mathbf{b}^h, \mathbf{b}^i\right) = Cone\left(-\mathbf{b}^e, \mathbf{b}^h\right)$, *that is,* $Cone\left(-\mathbf{b}^e, \mathbf{b}^h\right)$ *is the largest cone spanned by* $\left\{-\mathbf{b}^w, -\mathbf{b}^e, -\mathbf{b}^g, -\mathbf{b}^{ps}, \mathbf{b}^h, \mathbf{b}^i\right\}$

Assumption 3 $\theta \notin Cone\left(-\mathbf{b}^w, \mathbf{b}^h\right)$ *and* $Cone\left(-\mathbf{b}^w, \mathbf{b}^h\right)$ *is the largest cone spanned by* $\left\{-\mathbf{b}^w, -\mathbf{b}^g, -\mathbf{b}^{ps}, \mathbf{b}^h, \mathbf{b}^i\right\}$

Assumption 4 $-\mathbf{b}^w, \mathbf{b}^h < 0$

Assumption 1 guarantees that a solution to equation (**??**) with $\widetilde{\boldsymbol{\beta}} \geq 0$ exists. Together with Assumptions 2 and 3, it also guarantees that $\widetilde{\beta}^e > 0$. Given Assumptions 1, 2 and 3, Assumption 4 is not strictily necessary for us to be able to find bounds for $\widetilde{\beta}^e$, but it is satisfied by the empirical counterparts and facilitates our derivation.
Define $\mathbf{y}$ as:

$$\begin{pmatrix} y_1 \\ y_2 \end{pmatrix} = \widetilde{\beta}^w \begin{pmatrix} -b_1^w \\ -b_2^w \end{pmatrix} + \widetilde{\beta}^g \begin{pmatrix} -b_1^g \\ -b_2^g \end{pmatrix}$$
$$+ \widetilde{\beta}^{ps} \begin{pmatrix} -b_1^{ps} \\ -b_2^{ps} \end{pmatrix} + \widetilde{\beta}^h \begin{pmatrix} b_1^h \\ b_2^h \end{pmatrix} + \widetilde{\beta}^i \begin{pmatrix} b_1^i \\ b_2^i \end{pmatrix},$$

So that

$$\begin{pmatrix} \theta_1 \\ \theta_2 \end{pmatrix} = \widetilde{\beta}^e \begin{pmatrix} -b_1^e \\ -b_2^e \end{pmatrix} + \begin{pmatrix} y_1 \\ y_2 \end{pmatrix}$$

and $\mathbf{y} \in Cone\left(-\mathbf{b}^w, \mathbf{b}^h\right)$. Rewriting:

$$\begin{pmatrix} \theta_1 - y_1 \\ \theta_2 - y_2 \end{pmatrix} = \widetilde{\beta}^e \begin{pmatrix} -b_1^e \\ -b_2^e \end{pmatrix}$$

$$\Rightarrow \begin{cases} -\widetilde{\beta}^e b_1^e = \theta_1 - y_1 \\ -\widetilde{\beta}^e b_2^e = \theta_2 - y_2 \end{cases}$$

$$\Rightarrow \widetilde{\beta}^e = \frac{\theta_2 - y_2}{-b_2^e} = \frac{\theta_1 - y_1}{-b_1^e}$$

$$\Rightarrow y_2 = -\frac{b_2^e}{b_1^e}\left(\theta_1 - y_1\right) + \theta_2$$

It is easy to see graphically on Figure **??** that, $\mathbf{y} \in Cone\left(-\mathbf{b}^w, \mathbf{b}^h\right)$ and $-\mathbf{b}^w, \mathbf{b}^h < 0$ leads to $\frac{b_2^w}{b_1^w} < \frac{y_2}{y_1} < \frac{b_2^h}{b_1^h}$ and $y_2, y_1 < 0$. Using $\frac{b_2^w}{b_1^w} < \frac{y_2}{y_1} < \frac{b_2^h}{b_1^h}$ and $y_1 < 0$ we get:

$$\frac{b_2^w}{b_1^w} y_1 > -\frac{b_2^e}{b_1^e}\left(\theta_1 - y_1\right) + \theta_2 > \frac{b_2^h}{b_1^h} y_1$$

$$\Rightarrow \left(\frac{b_2^w}{b_1^w} - \frac{b_2^e}{b_1^e}\right) y_1 > -\frac{b_2^e}{b_1^e}\theta_1 + \theta_2 > \left(\frac{b_2^h}{b_1^h} - \frac{b_2^e}{b_1^e}\right) y_1$$

Assume that $\left(\frac{b_2^w}{b_1^w} - \frac{b_2^e}{b_1^e}\right) > 0$ and $\left(\frac{b_2^h}{b_1^h} - \frac{b_2^e}{b_1^e}\right) > 0$ – this is met by the empirical counterparts. We obtain:

$$\frac{-\frac{b_2^e}{b_1^e}\theta_1 + \theta_2}{\left(\frac{b_2^h}{b_1^h} - \frac{b_2^e}{b_1^e}\right)} > y_1 > \frac{-\frac{b_2^e}{b_1^e}\theta_1 + \theta_2}{\left(\frac{b_2^w}{b_1^w} - \frac{b_2^e}{b_1^e}\right)}$$

Remember that $\beta^e = \frac{\theta_1 - y_1}{b_1^e}$ and assume that $b_1^e > 0$ – this is also met by the empirical counterparts. We obtain:

$$\frac{\theta_1 b_2^h - \theta_2 b_1^h}{b_1^e b_2^h - b_1^h b_2^e} < \beta^e < \frac{\theta_1 b_2^w - \theta_2 b_1^w}{b_1^e b_2^w - b_1^w b_2^e}$$

These bounds can be estimated with:

$$\widehat{\beta}_L^e = \frac{\widehat{\theta}_1 \widehat{b}_2^h - \widehat{\theta}_2 \widehat{b}_1^h}{\widehat{b}_1^e \widehat{b}_2^h - \widehat{b}_1^h \widehat{b}_2^e}$$

$$\widehat{\beta}^e_U = \frac{\widehat{\theta}_1 \widehat{b}^w_2 - \widehat{\theta}_2 \widehat{b}^w_1}{\widehat{b}^e_1 \widehat{b}^w_2 - \widehat{b}^w_1 \widehat{b}^e_2}$$

If earnings ($\Delta \log (w_r)$) are excluded from equation (**??**), then we can obtain an alternative upper bound for β^e following the same steps as above. First, note that

$$\widehat{\theta} \in Cone\left(-\widehat{\mathbf{b}}^e, \widehat{\mathbf{b}}^h\right)$$

but

$$\widehat{\theta} \notin Cone\left(-\widehat{\mathbf{b}}^{ps}, \widehat{\mathbf{b}}^h\right)$$

and that $Cone\left(-\widehat{\mathbf{b}}^{ps}, \widehat{\mathbf{b}}^h\right)$ is the largest cone spanned by $\left\{-\widehat{\mathbf{b}}^g, -\widehat{\mathbf{b}}^{ps}, \widehat{\mathbf{b}}^h, \widehat{\mathbf{b}}^i\right\}$. This leads us to make assumptions similar to 1-3, which essentially imply that the configuration of population vectors $-\mathbf{b}^e, -\mathbf{b}^g, -\mathbf{b}^{ps}, \mathbf{b}^h, \mathbf{b}^i$ is similar to the configuration of their empirical counterparts.

Assumption 5 $\theta \in Cone\left(-\mathbf{b}^e, -\mathbf{b}^g, -\mathbf{b}^{ps}, \mathbf{b}^h, \mathbf{b}^i\right) = Cone\left(-\mathbf{b}^e, \mathbf{b}^h\right)$

Assumption 6 $Cone\left(-\mathbf{b}^e, -\mathbf{b}^g, -\mathbf{b}^{ps}, \mathbf{b}^h, \mathbf{b}^i\right) = Cone\left(-\mathbf{b}^e, \mathbf{b}^h\right)$*, that is,* $Cone\left(-\mathbf{b}^e, \mathbf{b}^h\right)$ *is the largest cone spanned by* $\left\{-\mathbf{b}^e, -\mathbf{b}^g, -\mathbf{b}^{ps}, \mathbf{b}^h, \mathbf{b}^i\right\}$

Assumption 7 $\theta \notin Cone\left(-\mathbf{b}^{ps}, \mathbf{b}^h\right)$ *and* $Cone\left(-\mathbf{b}^{ps}, \mathbf{b}^h\right)$ *is the largest cone spanned by* $\left\{-\mathbf{b}^g, -\mathbf{b}^{ps}, \mathbf{b}^h, \mathbf{b}^i\right\}$

Assumption 8 $-\mathbf{b}^{ps}, \mathbf{b}^h < 0$

With Assumptions 5 to 8 replacing Assumptions 1 to 4, we follow the same procedure above to obtain the following upper bound for β^e:

$$\frac{\theta_1 b^{ps}_2 - \theta_2 b^{ps}_1}{b^e_1 b^{ps}_2 - b^{ps}_1 b^e_2}$$

Which can be estimated with:

$$\widehat{\beta}^e_U = \frac{\widehat{\theta}_1 \widehat{b}^{ps}_2 - \widehat{\theta}_2 \widehat{b}^{ps}_1}{\widehat{b}^e_1 \widehat{b}^{ps}_2 - \widehat{b}^{ps}_1 \widehat{b}^e_2}$$

So that $\widehat{\beta}^e_U$ solves:

$$\begin{pmatrix} \widehat{\beta}^{ps}_U \\ \widehat{\beta}^e_U \end{pmatrix} = \begin{pmatrix} \widehat{b}^{ps}_1 & \widehat{b}^e_1 \\ \widehat{b}^{ps}_2 & \widehat{b}^e_2 \end{pmatrix}^{-1} \begin{pmatrix} \widehat{\theta}_1 \\ \widehat{\theta}_2 \end{pmatrix}$$

G Bounds $\widehat{\beta}^e_U$ and $\widehat{\beta}^e_L$ as 2SLS Estimators

This section shows that equation (**??**) defines an estimator that is algebraically equivalent to a 2SLS estimator where (1) the estimating equation stacks medium- and long-run changes; and (2) instruments are given by $RTC \times Period_{91-00}$ and $RTC \times Period_{91-10}$. Without loss of generality, we omit state fixed effects and exogenous covariates to simplify the exposition.

Suppose we want to estimate the model below, where we stack medium-run changes (Δ_1) and long-run changes (Δ_2) and employ 2SLS with $RTC \times Period_1$ and $RTC \times Period_2$ as instruments. $Period_1$ indicates if observations relate to medium-run changes (1991-2000) and $Period_2$ indicates if observations relate to long-run changes (1991-2010).

$$\begin{pmatrix} \Delta_1 \log(CR) \\ \Delta_2 \log(CR) \end{pmatrix} = \beta^e \begin{pmatrix} \Delta_1 \log(P_e) \\ \Delta_2 \log(P_e) \end{pmatrix} + \beta^w \begin{pmatrix} \Delta_1 \log(w) \\ \Delta_2 \log(w) \end{pmatrix} + \varepsilon \tag{3}$$

First stage equations are:

$$\begin{pmatrix} \Delta_1 \log(w) \\ \Delta_2 \log(w) \end{pmatrix} = \begin{pmatrix} RTC \times Period_1 & RTC \times Period_2 \end{pmatrix} \begin{pmatrix} b_1^w \\ b_2^w \end{pmatrix} + u^w$$

$$\begin{pmatrix} \Delta_1 \log(P_e) \\ \Delta_2 \log(P_e) \end{pmatrix} = \begin{pmatrix} RTC \times Period_1 & RTC \times Period_2 \end{pmatrix} \begin{pmatrix} b_1^e \\ b_2^e \end{pmatrix} + u^e,$$

where b_1^X is the medium-run effect of RTC on variable X, and b_2^X is the long-run effect. In matrix notation:

$$\begin{pmatrix} \Delta_1 \log(w) & \Delta_1 \log(P_e) \\ \Delta_2 \log(w) & \Delta_2 \log(P_e) \end{pmatrix} = \begin{pmatrix} RTC \times Period_1 & RTC \times Period_2 \end{pmatrix} \begin{pmatrix} b_1^w & b_1^e \\ b_2^w & b_2^e \end{pmatrix} + \begin{pmatrix} u^w & u^e \end{pmatrix}$$

First stage predictions are given by:

$$\begin{pmatrix} \Delta_1 \widehat{\log(w)} & \Delta_1 \widehat{\log(P_e)} \\ \Delta_2 \widehat{\log(w)} & \Delta_2 \widehat{\log(P_e)} \end{pmatrix} = \underbrace{\begin{pmatrix} RTC \times Period_1 & RTC \times Period_2 \end{pmatrix}}_{Z} \underbrace{\begin{pmatrix} \widehat{b}_1^w & \widehat{b}_1^e \\ \widehat{b}_2^w & \widehat{b}_2^e \end{pmatrix}}_{\widehat{\mathbf{b}}} = Z\widehat{\mathbf{b}}$$

By definition, the 2SLS estimator of β^e and β^w in equation (3) are given by the projection coefficients of $\begin{pmatrix} \Delta_1 \log(CR) \\ \Delta_2 \log(CR) \end{pmatrix}$ onto $\begin{pmatrix} \Delta_1 \widehat{\log(w)} & \Delta_1 \widehat{\log(P_e)} \\ \Delta_2 \widehat{\log(w)} & \Delta_2 \widehat{\log(P_e)} \end{pmatrix} = Z\widehat{\mathbf{b}}$.

$$\begin{pmatrix} \widehat{\beta}^w \\ \widehat{\beta}^e \end{pmatrix}^{2SLS} = \left(\widehat{\mathbf{b}}' Z' Z \widehat{\mathbf{b}}\right)^{-1} \widehat{\mathbf{b}}' Z' \begin{pmatrix} \Delta_1 \log(CR) \\ \Delta_2 \log(CR) \end{pmatrix}$$

The reduced-form estimates – projection coefficients of $(\Delta_1 \log(CR) \;\; \Delta_2 \log(CR))'$ onto the instruments Z – is given by:

$$\begin{pmatrix} \widehat{\theta}_1 \\ \widehat{\theta}_2 \end{pmatrix} = \left(Z'Z\right)^{-1} Z' \begin{pmatrix} \Delta_1 \log(CR) \\ \Delta_2 \log(CR) \end{pmatrix}$$

$$\left(Z'Z\right) \begin{pmatrix} \widehat{\theta}_1 \\ \widehat{\theta}_2 \end{pmatrix} = Z' \begin{pmatrix} \Delta_1 \log(CR) \\ \Delta_2 \log(CR) \end{pmatrix}$$

Rewriting:

$$
\begin{aligned}
\begin{pmatrix} \widehat{\beta}^w \\ \widehat{\beta}^e \end{pmatrix}^{2SLS} &= \left(\widehat{\mathbf{b}}' Z' Z \widehat{\mathbf{b}}\right)^{-1} \widehat{\mathbf{b}}' \left(Z' Z\right) \begin{pmatrix} \widehat{\theta}_1 \\ \widehat{\theta}_2 \end{pmatrix} \\
&= \widehat{\mathbf{b}}^{-1} \begin{pmatrix} \widehat{\theta}_1 \\ \widehat{\theta}_2 \end{pmatrix} \\
&= \begin{pmatrix} \widehat{b}_1^w & \widehat{b}_1^e \\ \widehat{b}_2^w & \widehat{b}_2^e \end{pmatrix}^{-1} \begin{pmatrix} \widehat{\theta}_1 \\ \widehat{\theta}_2 \end{pmatrix}
\end{aligned}
$$

The right hand side of the above equation is equal to the right hand side of equation (**??**).

H Vector Configuration With Demographic Controls

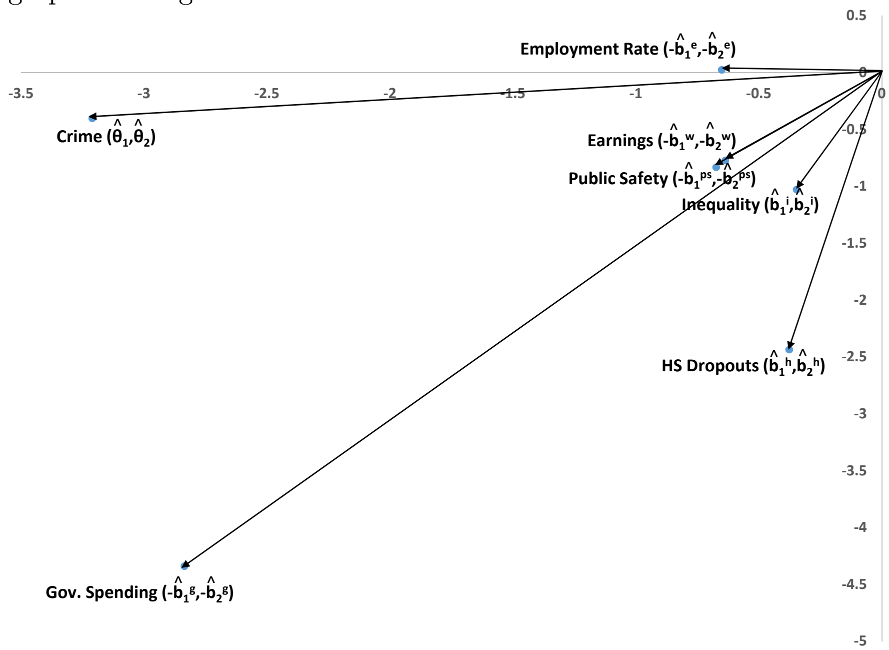
This appendix checks if the configuration of vectors $\left\{-\widehat{\boldsymbol{b}}^e, -\widehat{\boldsymbol{b}}^w, -\widehat{\boldsymbol{b}}^g, -\widehat{\boldsymbol{b}}^{ps}, \widehat{\boldsymbol{b}}^h, \widehat{\boldsymbol{b}}^i\right\}$ is similar to the one pictured in Figure **??** once we add demographic controls such as changes in urbanization rates and changes in the fraction of the population who is young (18 to 30 years old), unskilled (eighth grade completed or less) and male. Table H.3 displays the regression results, and Figure H.6 shows the configuration of these vectors, confirming that the configuration of estimated vectors – controlling for demographic changes – is similar to those in Figure **??**.

Table H.3: Medium- and Long-Run Effects of RTC – Controlling for Demograhic Changes

Dep. Var.:	$\Delta\log(CR_r)$ (1)	$\Delta\log(P_{e,r})$ (2)	$\Delta\log(w_r)$ (3)	$\Delta\log(PS_r)$ (4)	$\Delta\log(GovSp_r)$ (5)	$\Delta\log(HSDrop_r)$ (6)	$\Delta\log(Ineq_r)$ (7)
$RTC_r \times Period_{91-00}$	-3.210**	0.650***	0.636***	0.673*	2.835***	-0.376*	-0.346***
	(1.243)	(0.0682)	(0.121)	(0.351)	(0.676)	(0.193)	(0.0640)
$RTC_r \times Period_{91-10}$	-0.402	-0.0245	0.772***	0.831	4.340***	-2.436***	-1.028***
	(2.422)	(0.120)	(0.220)	(0.544)	(0.776)	(0.280)	(0.143)
$\Delta\log$ (Share YUM$_r$)	0.274	-0.0304	-0.241***	0.447***	0.581**	0.00573	0.218***
	(0.439)	(0.0367)	(0.0554)	(0.118)	(0.252)	(0.0546)	(0.0388)
$\Delta\log$ (Share Urban$_r$)	-0.841***	0.00940	0.00852	0.0562	0.0400	0.0204	-0.0127
	(0.311)	(0.0357)	(0.0466)	(0.213)	(0.131)	(0.0966)	(0.0289)
Observations	822	822	822	822	815	822	822
R-squared	0.584	0.821	0.929	0.462	0.681	0.676	0.664

Notes: Decennial Census data. Standard errors (in parentheses) adjusted for 91 meso-region clusters. Unit of analysis r is a micro-region. Observations are weighted by population. All specifications stack 1991-2000 and 1991-2010 changes and control for state-period fixed effects. There are 6 missing values for government spending in column (3).
Significant at the *** 1 percent, ** 5 percent, * 10 percent level.

Figure H.6: Medium *versus* Long-Run Effects of *RTC* on Different Channels – Controlling for Demographic Changes



The horizontal axis represents the medium-term effects and the vertical axis represents long-term effects of RTC_r on each outcome estimated in Tables **??**, **??** and **??**. See text and equation (**??**) for details.

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