Trade, Institutions and Ethnic Tolerance: Evidence from South Asia

Saumitra Jha

Online Appendix

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Table 1: **Effect of Medieval Trade on Colonial Income and Religious Demography**

	(1)	(2)	(3)	(4)	(5)	(6)
A) OLS	|%Muslims in Town - District|			Log Mun. Income Per Capita		
Medieval Overseas Port	0.140**	0.126*	0.103	-0.385**	-0.384*	-0.424*
	[0.058]	[0.072]	[0.079]	[0.168]	[0.209]	[0.211]
Medieval Town		0.058**	0.074**		-0.358**	-0.218
		[0.028]	[0.032]		[0.143]	[0.158]
Mughal Mint in Town		0.056**	0.062**		0.056	0.059
		[0.025]	[0.028]		[0.198]	[0.158]
R-squared	0.38	0.42	0.55	0.11	0.22	0.5
B) IV						
Medieval Overseas Port	0.299**	0.420**	0.355**	-1.899**	-2.463**	-2.678***
	[0.135]	[0.187]	[0.174]	[0.832]	[1.166]	[0.914]
C) Placebo (OLS)						
Port with foreign trade, 1907	0.042	0.041	0.018	-0.425*	-0.142	0.236
	[0.066]	[0.079]	[0.101]	[0.235]	[0.226]	[0.350]
R-squared	0.37	0.41	0.54	0.11	0.21	0.49
Sample	Subcontinental			British Municipalities		
Observations	237	237	237	195	195	195
Controls	Initial	Medieval	Medieval	Initial	Medieval	Medieval
Province / NS x Annex FE	no	no	yes	no	no	yes

Notes: All regressions include quadratic polynomials in Longitude and Latitude and Log. Distances from the Modern Coast, Navigable Rivers and the Ganges, Coastal Town and Natural Disasters. Medieval-era controls add: Medieval Town, Mughal Mint, Other Patronage Center, Inland Trade Route, Skilled Crafts in Town, Major Shi'a State, Centuries Muslim Rule. Robust standard errors (clustered at Native State x Annexation level): * significant at 10%; ** 5%; *** 1%

Appendix Table 1 estimates the effect of a medieval trading legacy on indices of income and religious demography. Note that medieval ports tend to have greater proportions of Muslims and lower municipal income per capita, both relative to otherwise similar non-medieval port towns (Panel A) and to towns that would have been medieval ports had they been at natural harbours (Panel B).However, despite being poorer and more ethnically mixed, medieval ports exhibit *lower* violence. Once again, as the placebo checks reveal, these effects are specific to medieval, not colonial, ports (Panel C).

Table 2: **Interactions with Contemporaneous Population and Religious Demography**

	(1) Neg. Bin. (I. Ratios)	(2) Neg. Bin. (I. Ratios)	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS	(8) OLS
Medieval Overseas Port	0.479***	0.534**	-1.213**	-0.882*	-0.472	-0.455	-1.292**	-0.893*
	[0.127]	[0.154]	[0.544]	[0.462]	[0.526]	[0.617]	[0.538]	[0.466]
Log Population, 1901	2.884***	2.793***	0.487*	0.610	1.652***	1.443***	0.432	0.540
	[0.249]	[0.352]	[0.273]	[0.372]	[0.412]	[0.427]	[0.274]	[0.368]
% Muslim in town, 1901	1.398***	1.334**	0.070	0.021	0.390***	0.356*	0.097	-0.003
	[0.158]	[0.164]	[0.136]	[0.177]	[0.124]	[0.178]	[0.168]	[0.185]
% Muslim in town^2, 1901	0.872**	0.859***	0.041	0.086	-0.219***	-0.220***	-0.139	-0.126
	[0.048]	[0.046]	[0.043]	[0.061]	[0.077]	[0.074]	[0.135]	[0.125]
Medieval Port x Log Population					-1.248**	-1.601***	-1.490*	-1.712
					[0.559]	[0.543]	[0.830]	[1.221]
Medieval Port x % Muslim					-0.428*	-0.111	-0.026	-0.076
					[0.247]	[0.311]	[0.299]	[0.368]
Medieval Port x % Muslim^2					0.282*	0.151	0.060	0.086
					[0.139]	[0.118]	[0.104]	[0.105]
Observations	248	248	110	89	248	248	110	89
R-squared			0.54	0.64	0.38	0.41	0.58	0.69
F-test (Medieval Port Variables)					3.95	3.84	1.46	1.39
Prob>F					0.01	0.01	0.27	0.29
Sample	Full	Full	Coastal, <200km	Coastal, <100km	Full	Full	Coastal, <200km	Coastal, <100km
Controls	Initial	Medieval	Medieval	Medieval	Initial	Medieval	Medieval	Medieval
Province / NS x Annex FE	No	No	Yes	Yes	No	No	Yes	Yes

Notes: All regressions include quadratic polynomials in Longitude and Latitude and Log. Distances from the Modern Coast, Navigable Rivers and the Ganges, Coastal Town and Natural Disasters. Medieval-era controls add: Medieval Town, Mughal Mint, Other Patronage Center, Inland Trade Route, Skilled Crafts in Town, Major Shi'a State, Centuries Muslim Rule. Orthogonal polynomials in the Proportion Muslim are used. All interactions are demeaned. Robust standard errors (clustered at Native State x Annexation level): * significant at 10%; ** 5%; *** 1%.

Despite the endogeneity of ethnic demography and population, assessing the residual effect of historical robust complementarity controlling for these factors may be of interest. Appendix Table 2 adds controls for population in 1901, polynomials in the percentage Muslim in 1901 and their interaction with medieval port. The table reveals that more larger, ethnically mixed medieval ports actually are *less* prone to religious violence. These results are consistent with the persistence of inter-ethnic complementarity in medieval ports: when a minority population specialises in a complementary service, increases in its population tend to increase intra-minority competition and improve the terms of trade for the members of the majority, reducing incentives for expropriative violence. The size interaction also reassures that our results are not driven by possible under-reporting in small medieval port towns.

Table 3: **Survival of religious tolerance in towns of India, 1850-1950:** Cox proportional hazards regression providing hazard ratios of the time till first incidence of Hindu-Muslim rioting.

Hazard Ratios	(1)	(2)	(3)	(4)	(5)
Medieval Port	0.165***	0.118***	0.075***	0.047***	0.004***
	[0.058]	[0.064]	[0.020]	[0.049]	[0.007]
Mughal Mint in Town		1.598	6.723*	1.488	3.632
		[0.504]	[6.932]	[0.416]	[6.452]
Medieval Inland Trade Route		1.706***	5.645**	1.655***	5.534
		[0.245]	[4.291]	[0.286]	[7.488]
Medieval Skilled Crafts in Town		1.910***	1.292	2.197***	1.867
		[0.468]	[0.996]	[0.583]	[3.061]
Centuries Muslim Rule		1.314**	2.490***	1.148	3.801**
		[0.159]	[0.639]	[0.179]	[2.158]
Sample	Full	Full	Full, Coastal (<100km)	Full	Full, Coastal (<100km)
Controls	Initial	Medieval	Medieval	Medieval	Medieval
Province/ NS x Annex FE	No	No	No	Yes	Yes
Log-Likelihood	-1088.98	-1046.26	-86.13	-1005.69	-81.01
Observations	408	408	107	408	107

Notes: All regressions include quadratic polynomials in Longitude and Latitude and Log. Distances from the Modern Coast, Navigable Rivers and the Ganges, Coastal Town and Natural Disasters. Medieval-era controls add: Medieval Town, Mughal Mint, Other Patronage Center, Inland Trade Route, Skilled Crafts in Town, Major Shi'a State, Centuries Muslim Rule. Robust standard errors (clustered at Native State x Annexation level): * significant at 10%; ** 5%; *** 1%.

Appendix Table 3 provides Cox proportional hazards regressions of the survival of Hindu-Muslim tolerance (defined as time until the first outbreak of rioting) between 1850 and 1950, providing multivariate validation of the bivariate Kaplan-Meier comparison in the paper. Notice times ethnic tolerance in medieval ports have enjoyed a better survival probability than non-ports, with a medieval trade legacy reducing the hazard of religious rioting by between 6 times (Col 1) and more than 10 times (Cols 3-5) prior to 1950 when controlling for geographical and historical characteristics.

Table 4: **Continuity and Change in Medieval Ports Before and After 1980**

	(1) Neg. Bin (I Ratios)	(2) Neg. Bin (I Ratios)	(3) Neg. Bin (I Ratios)	(4) OLS	(5) OLS	(6) OLS	(7) OLS	(8) OLS	(9) OLS
Panel A: Number of Riots, 1950-1995									
Medieval Overseas Port	0.441***	0.387***	0.426***	-1.683*	-1.759*	-2.353	-2.876**	-3.451**	-2.227
	[0.137]	[0.097]	[0.131]	[0.890]	[0.941]	[1.473]	[1.117]	[1.217]	[1.890]
Panel B: Number of Riots, 1950-1980									
Medieval Overseas Port	0.774	0.467	0.471	-0.449	-0.436	-0.650	-0.843	-0.956*	-0.669*
	[0.725]	[0.331]	[0.500]	[0.362]	[0.368]	[0.372]	[0.523]	[0.477]	[0.309]
Log. Population, 1931							0.538**	0.551**	0.886*
							[0.202]	[0.209]	[0.400]
% Muslim, 1931							0.009**	0.009**	0.015**
							[0.004]	[0.004]	[0.005]
% Muslim Partition Outflows							-0.041**	-0.027	-0.239
							[0.017]	[0.024]	[0.312]
% Hindu/Sikh Partition Inflows							0.042**	0.024	0.103
							[0.018]	[0.018]	[0.156]
Med Port x Log. Population							-0.482*	-0.465*	-0.603
							[0.273]	[0.255]	[0.418]
Med Port x % Muslim							-0.005	-0.006	-0.007
							[0.005]	[0.005]	[0.009]
Med Port x % Inflows							0.026	-0.058	-0.171
							[0.073]	[0.064]	[0.189]
Med Port x % Outflows							-0.176***	-0.177***	-0.105
							[0.060]	[0.059]	[0.149]
R-squared				0.06	0.11	0.09	0.22	0.26	0.35
Panel C: Number of Riots, 1980-1995									
Medieval Overseas Port	0.460	0.383	0.682	-0.491	-0.652*	-0.997	-1.048	-1.447***	-1.195
	[0.328]	[0.232]	[0.432]	[0.429]	[0.372]	[1.069]	[0.613]	[0.315]	[1.451]
Log. Population, 1931							0.704**	0.700**	0.989
							[0.292]	[0.296]	[0.602]
% Muslim, 1931							0.003	0.002	0.010
							[0.006]	[0.005]	[0.021]
% Muslim Partition Outflows							-0.095	-0.099*	-0.564
							[0.062]	[0.048]	[0.390]
% Hindu/Sikh Partition Inflows							0.011	0.045	0.358
							[0.051]	[0.052]	[0.290]
Med Port x Log. Population							-0.694	-0.943	-2.849
							[0.701]	[0.713]	[2.180]
Med Port x % Muslim							0.015	0.016	-0.006
							[0.012]	[0.010]	[0.037]
Med Port x % Inflows							-0.433	-0.222	-0.514
							[0.262]	[0.230]	[0.357]
Med Port x % Outflows							-0.023	-0.225	0.418
							[0.106]	[0.231]	[0.505]
R-squared				0.15	0.21	0.30	0.19	0.24	0.38
Sample	Full	Full	Coast <200km	Full	Full	Coast <200km	Full	Full	Coast <200km
Control Set (Cumulative)	Historical	Historical	Historical	Historical	Historical	Historical	Independence	Independence	Independence
State (1991) FE	N	Y	Y	N	Y	Y	N	Y	Y
Observations	405	405	179	405	405	179	405	405	179

Notes: All regressions include quadratic polynomials in Longitude and Latitude and Log. Distances from the Modern Coast, Navigable Rivers and the Ganges, Coastal Town and Natural Disasters. Medieval-era controls add: Medieval Town, Mughal Mint, Other Patronage Center, Inland Trade Route, Skilled Crafts in Town, Major Shi'a State, Centuries Muslim Rule. Robust standard errors (clustered at 1991 State Level): * significant at 10%; ** 5%; *** 1%

Appendix Table 4 breaks down the riot effect over 1950-1995 into those that occurred before and after 1980. While this reduces the variation in the data– there are naturally fewer riots– the point estimates are fairly consistent before and after 1980: medieval ports continue to be half as riot-prone as other towns after 1980, and experience around 1.44 fewer riots, particularly when comparing towns within the same state and with the same levels of Partition flows (Col 7-9).

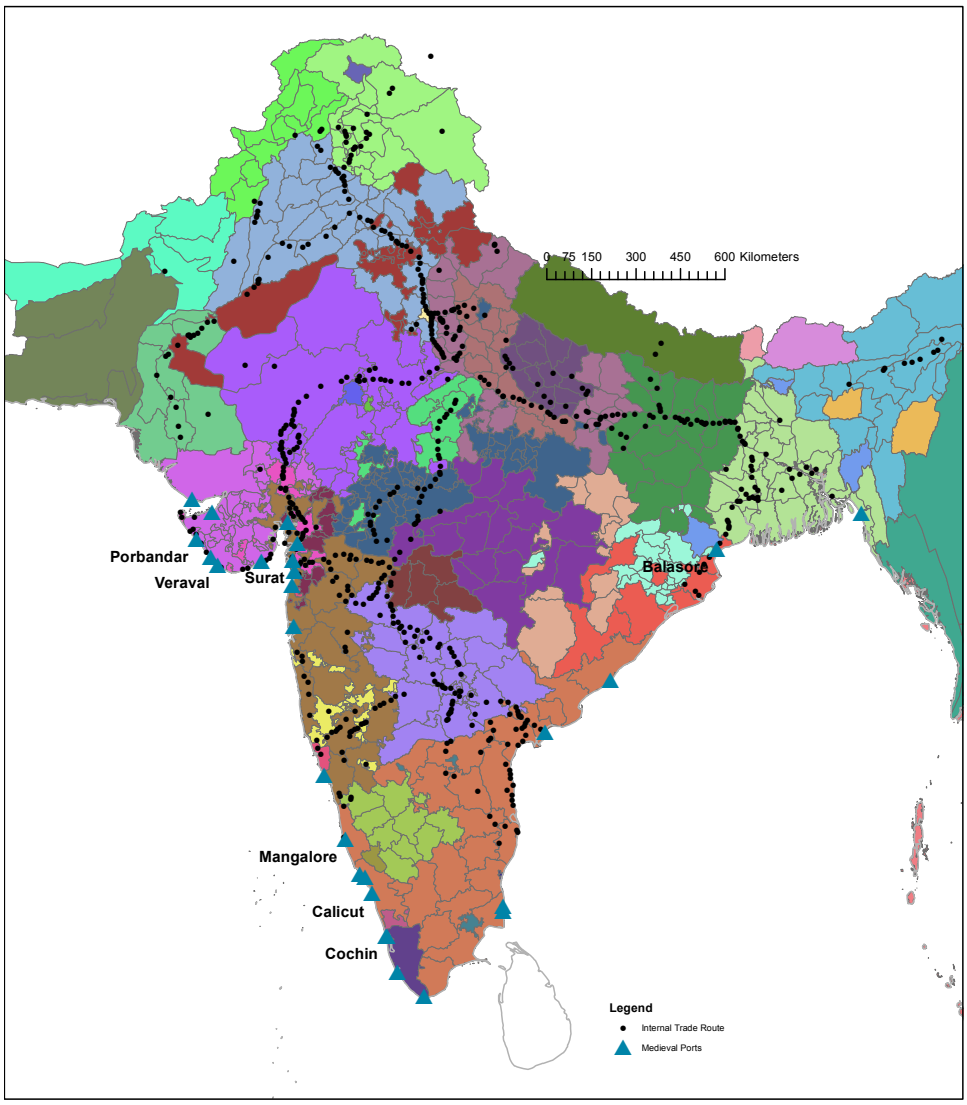


Figure 1: **Clusters: Native States and Provinces by Annexation Status**

In the pre-1950 analysis, I include 31 fixed effects for different natives states and provinces, interacted with the timing of a district's colonial annexation. I am conservative in allowing for arbitrary correlation within these clusters. The timing of annexation had a number of effects, including different land tenure systems (see e.g. Banerjee and Iyer 2005). These units are both historically relevant as jurisdictionally autonomous units and are larger in radius than the benchmark Conley cutoffs for spatial independence. Tables within the paper also show that the patterns are generally robust to clustering at other levels including the 1991 state level and the 2005 PSU level, as well as aggregating from the town-level to the district.

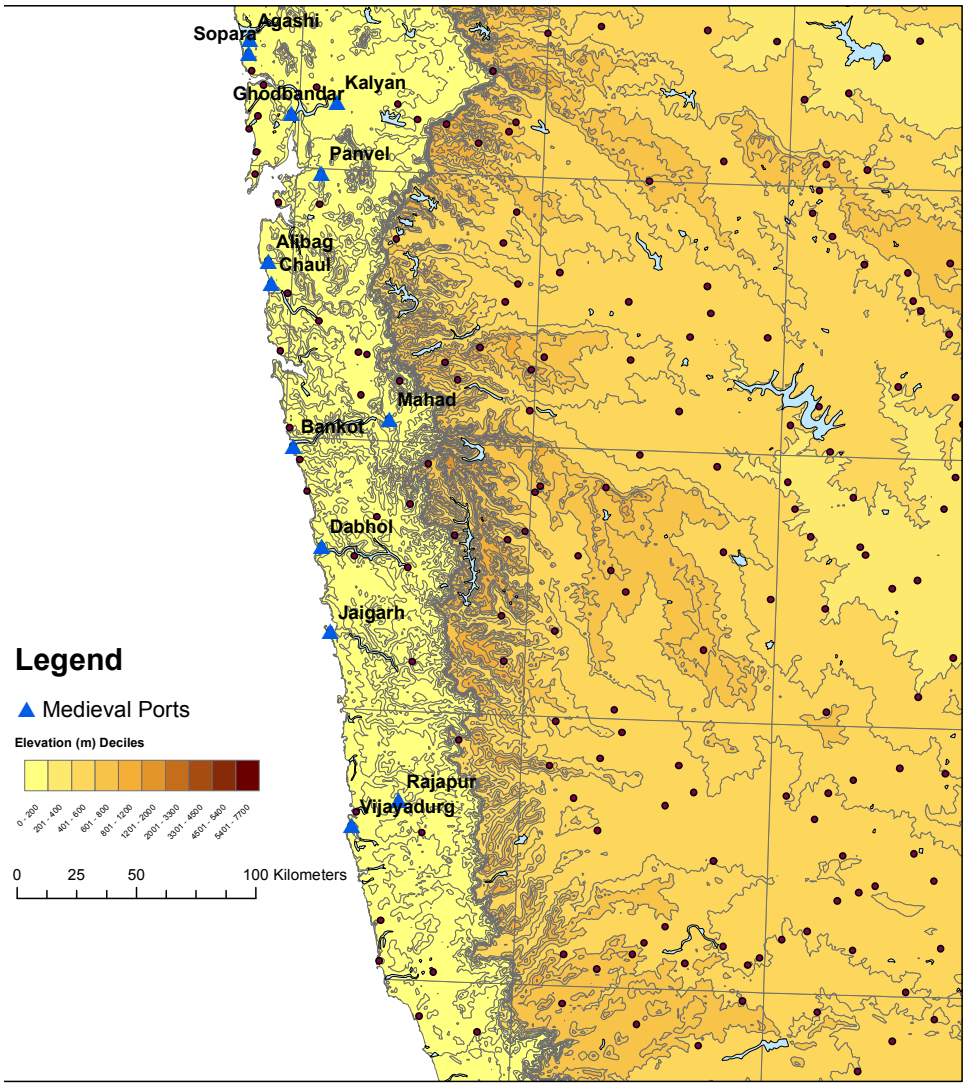


Figure 2: **Medieval Ports and Natural Harbours on the Colaba Coast**

This is the coastline just south of Bombay. Notice that medieval ports emerged on small indentations and water features near the coastline. In this example, a mountain range, the Western Ghats, both blocks such water features from penetrating while also causing major silting at the mouths of these rivers during the monsoon. This has resulted in some medieval ports being quite far inland and no longer enjoying a navigable outlet to the sea.

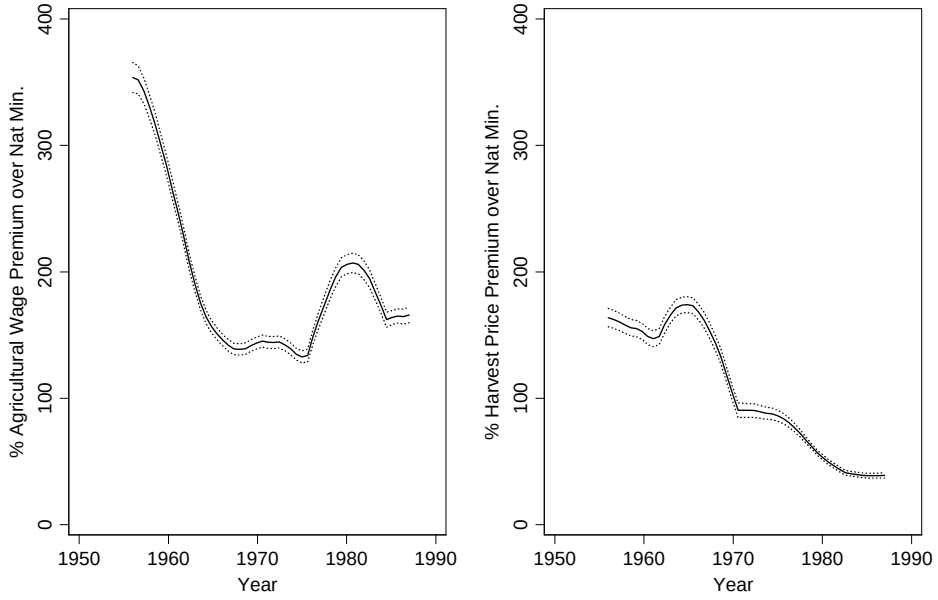
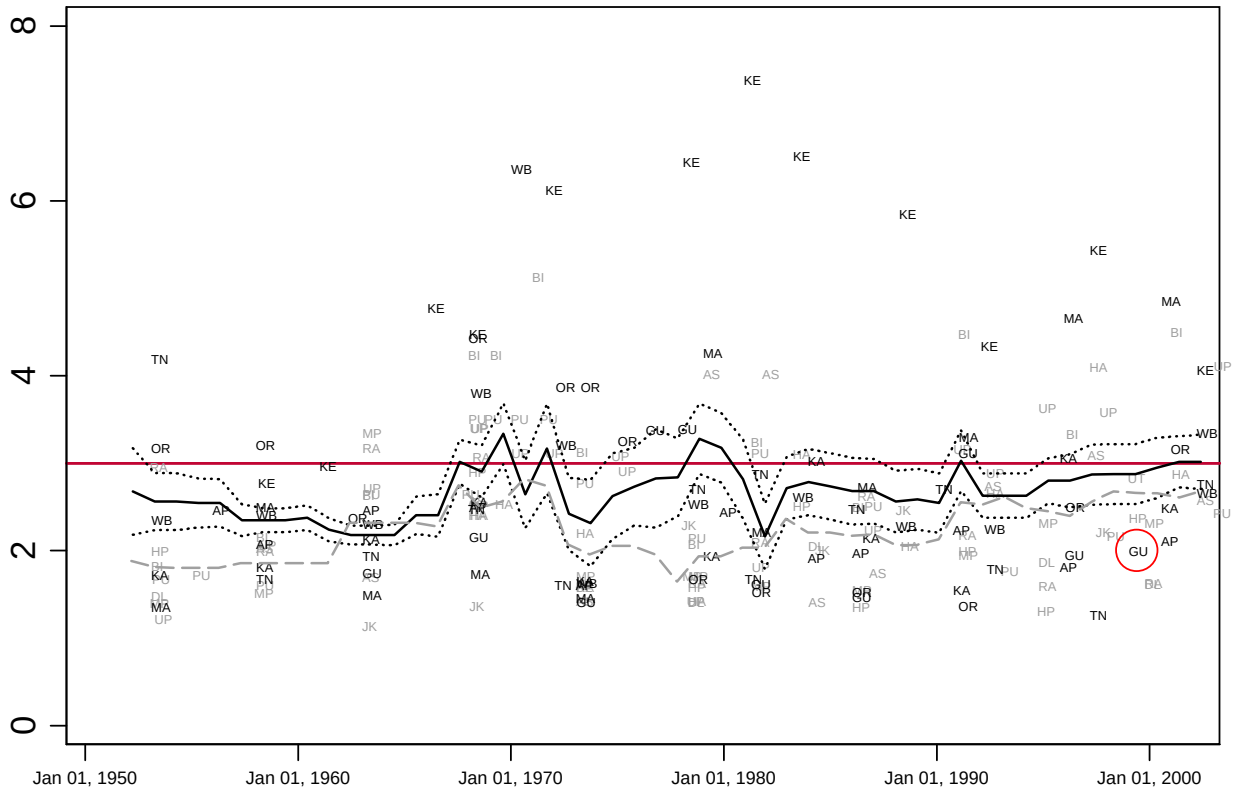


Figure 3: **Trends in Product and Labour Market Integration**

Local polynomial smooths based upon the World Bank Agricultural and Climate Data Set which covers 271 districts within India's major agricultural states (The Northeast, Himachal Pradesh, Jammu and Kashmir, West Godavari and Kerala are not in the data). The Harvest Price Premium is calculated as the harvest price difference each year for each major crop between the district and the yearly minimum for the country, weighted by the quantities produced in that district. The agricultural wage premium is simply the average rural agricultural wage in the district net of the yearly national minimum. Notice the general decline in harvest price differences for crops in different districts, consistent with increasing market integration for crops. In contrast, wage differences spiked in 1980 and continued to be larger thereafter, consistent with lower labour mobility between districts, and the persistence of differential local agricultural labour demand and supply conditions.

Figure 4: **Number of Effective Parties in Major Indian State Legislatures**



The number of effective parties is calculated at the state level according to $EP = \frac{1}{\sum v_i^2}$, where v_i is the vote share of the $i-th$ party. This measure weights parties with a higher vote share more heavily than those with a very low vote share. On this graph, Northeastern states and union territories (other than Delhi) are omitted. Local Polynomial Smooths have been applied on the number of effective parties in the state on any given day, by whether the state contains a medieval port (in bold). President's rule periods omitted. I gratefully acknowledge Steven Wilkinson for sharing these data.

Notice that Duverger's Law works on average, but with significant differences between states and over time. States with medieval ports have greater numbers of effective parties for much of this period, which may mitigate within-state differences in violence in medieval ports. However, the biggest degree of divergence with other states occurs on the eve of the Emergency (1977), after which there is a sharp decline in party competition medieval port states that has only gradually recovered. Notice that Gujarat between 1998 and 2002 has weak party competition.