

Temporary Trade Shocks, Spatial Reallocation, and Persistence in Developing Countries: Evidence from a Natural Experiment in West Africa

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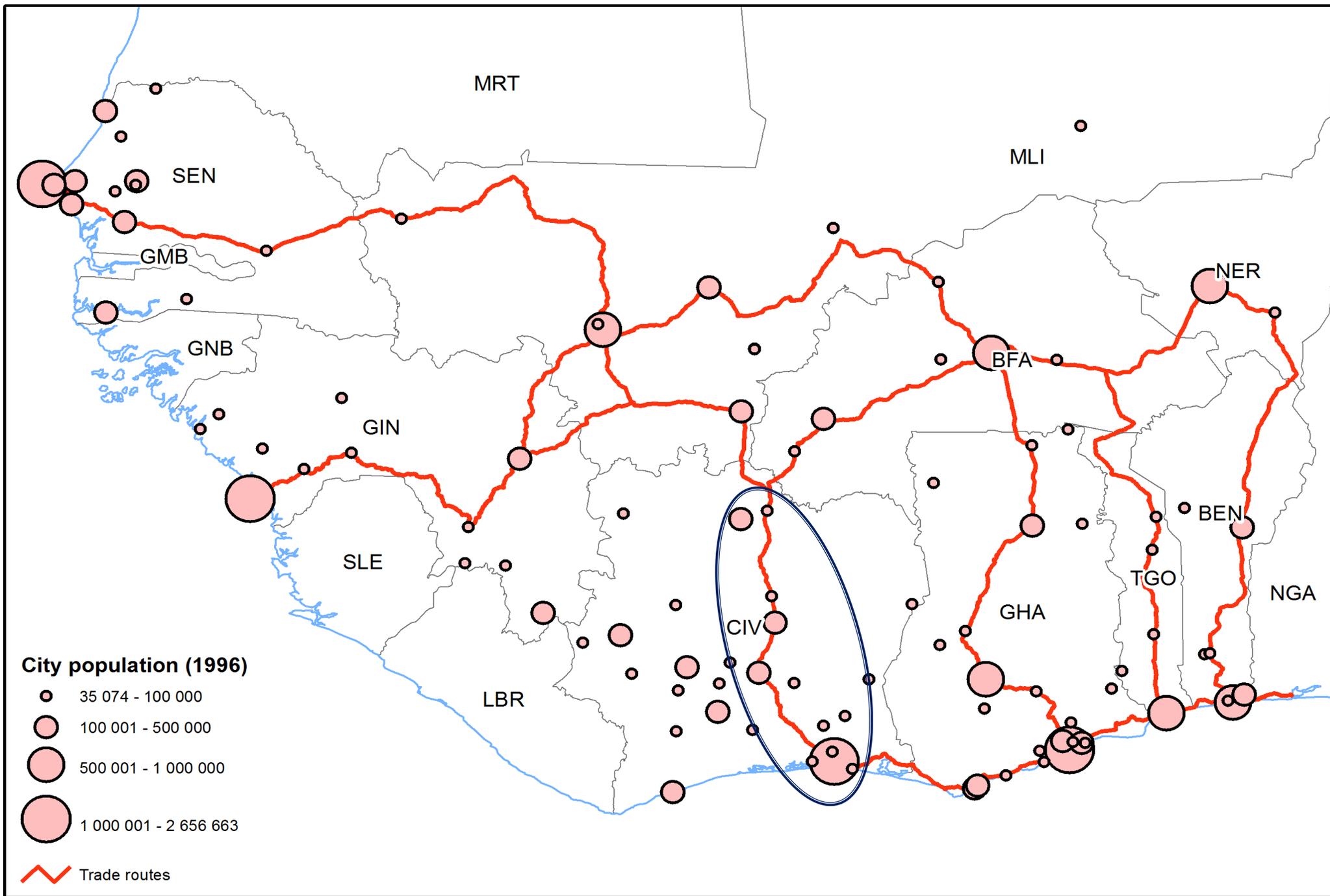
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Effects of Temporary Trade Shock

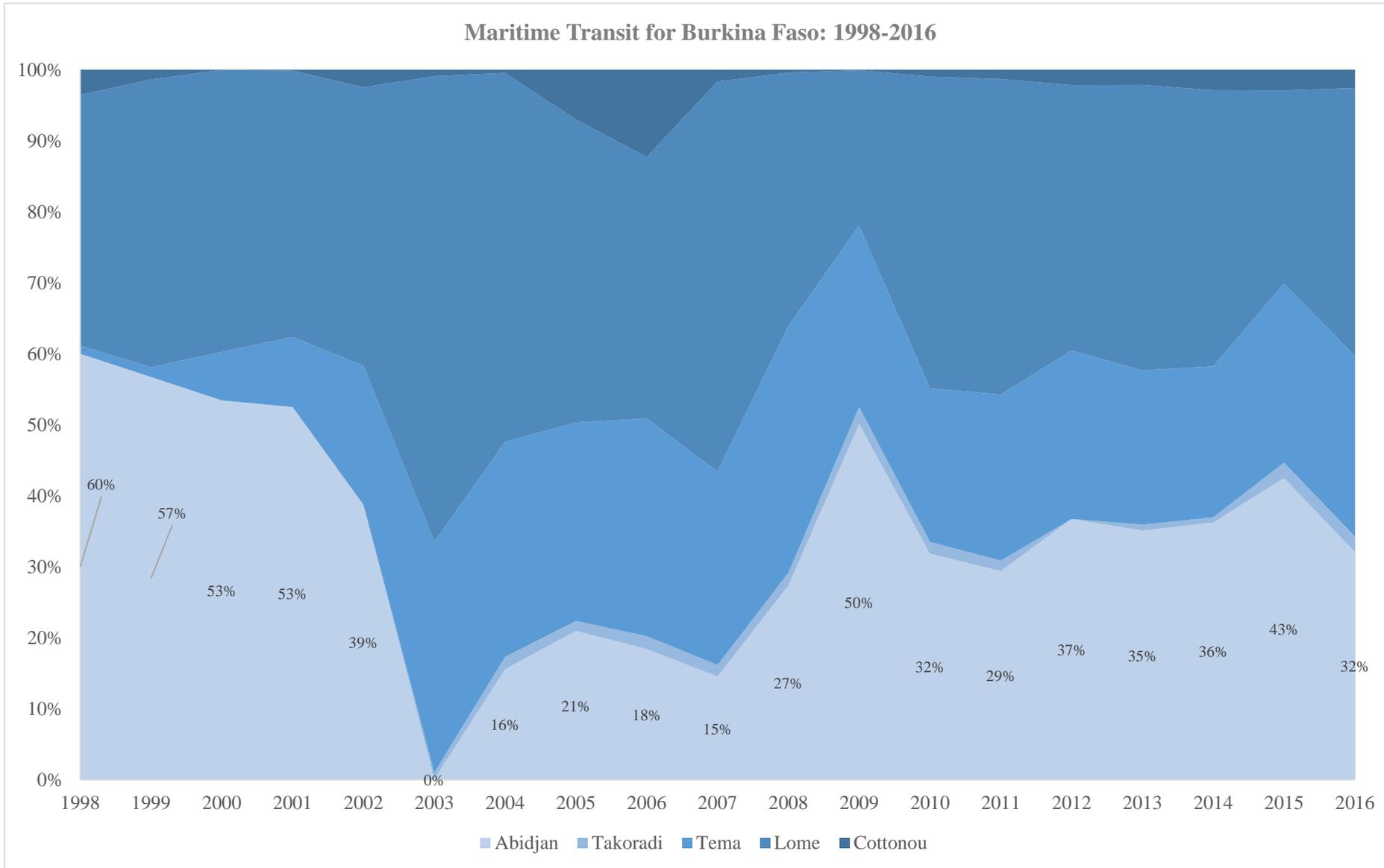
- Geographically unequal effects of international trade
 - Chinese import competition on labor markets (USA (Autor, Dorn and Hansen (2016) and other developed and developing countries (Brazil, South Africa))
- Increasingly protectionist policies: can effects be undone in future?
- Trade Shock and Regional Development: Effects of a temporary trade shock on spatial organization of employment activities
- Whether spatial re-organization creates pre-conditions for long term persistence. Study this in the context of West African countries

Trade Routes and Civil War in Cote-d-Ivoire

- Burkina Faso and Mali are landlocked and used Abidjan as their primary port for maritime trade in Pre-War period
- Civil War in Cote-d-Ivoire (2002-2007) Trade re-routed to other West African ports during the war
- Abidjan never recovered its market share
- Temporary shocks to market access
 - Reallocation of employment activities
 - Built-up density (persistence), nightlight luminosity (public investment), human capital (agglomeration forces)



International trade of Burkina Faso through Abidjan



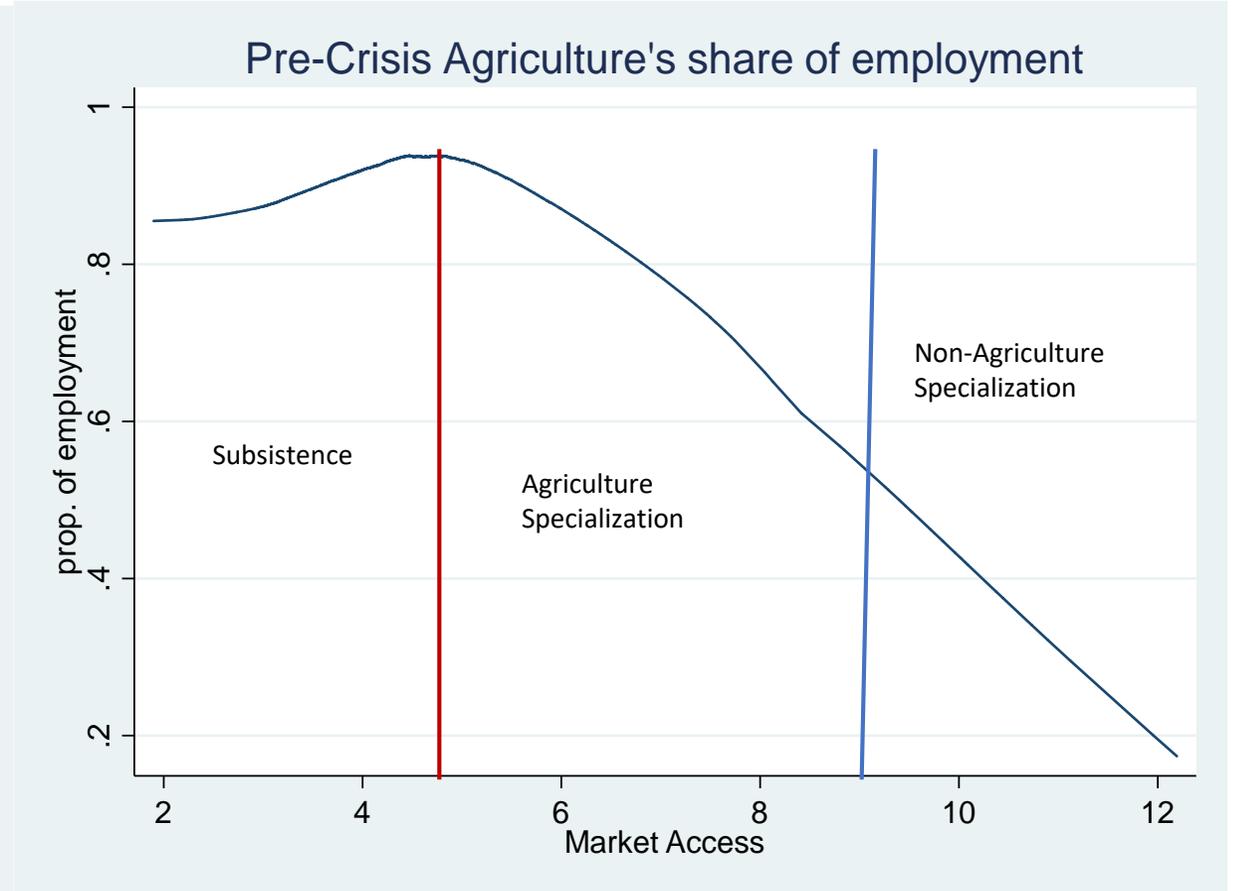
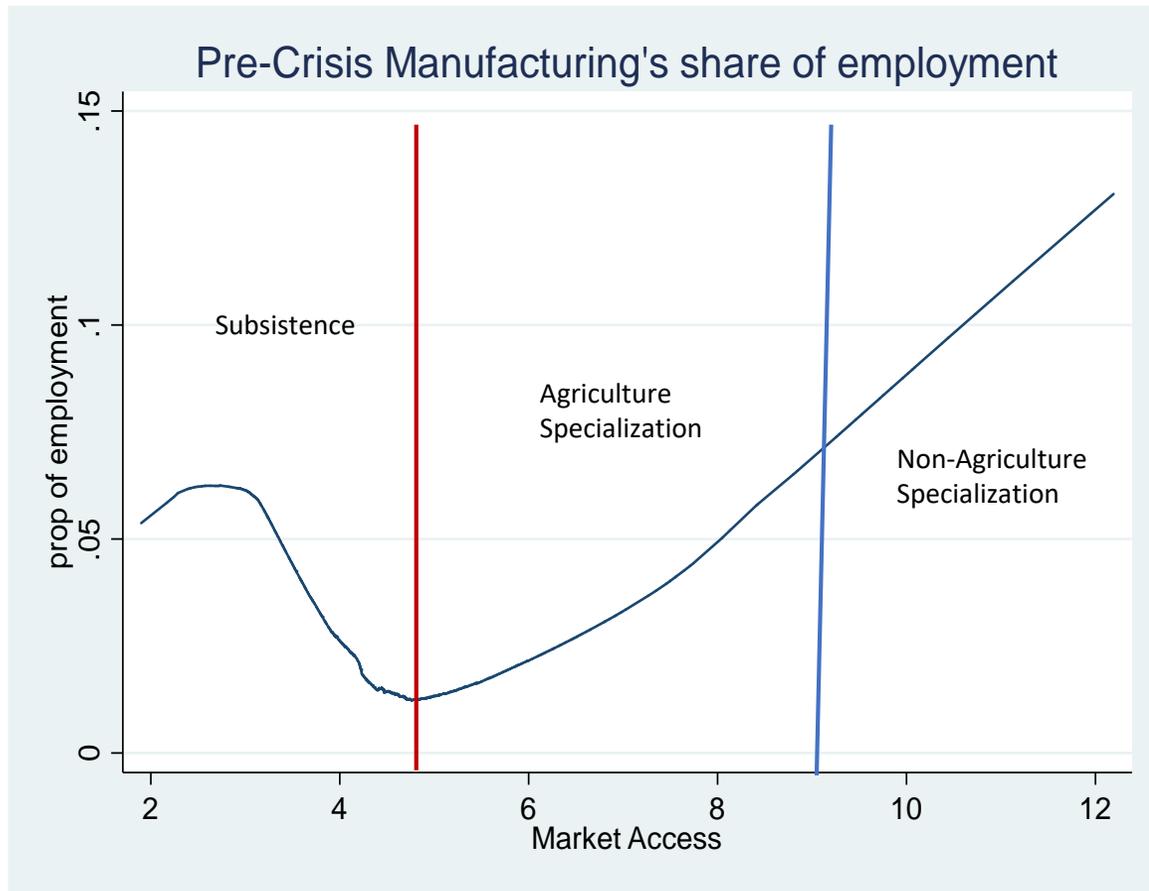
Related Literature

- Unequal effects of shock to market access
 - Berlin Wall in Germany [Redding and Strum (2008)]
- Long term persistence of short term shock on spatial development: [Bleakly and Lin (2012)] studied growth of cities created by portage need
- Long term persistence in the case of African countries: Jedwab and Moradi (2016) and (2017) for Ghana and Kenya
- Our analysis different in two important aspects:
 - Shorter time shock
 - Predominantly traditional economy

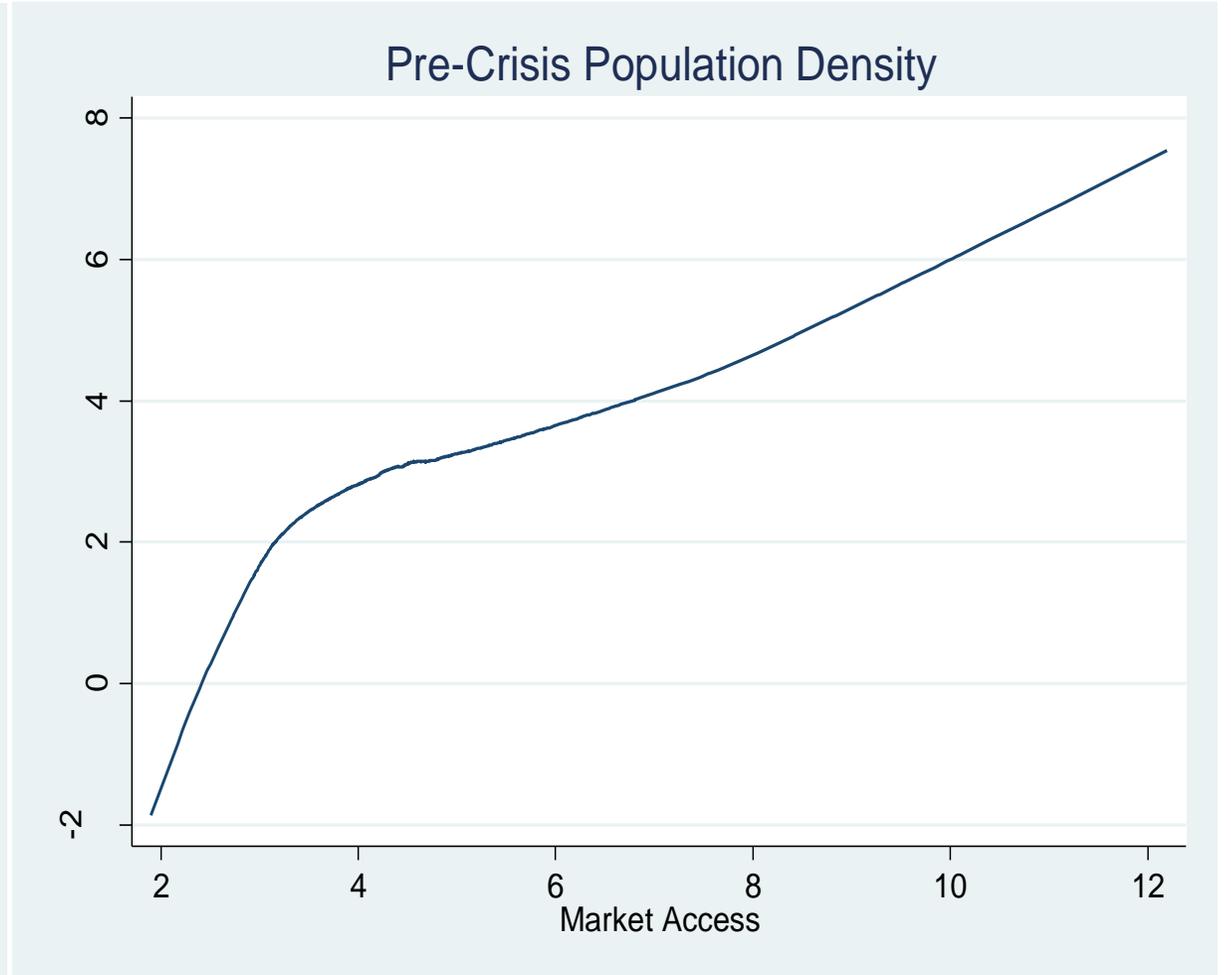
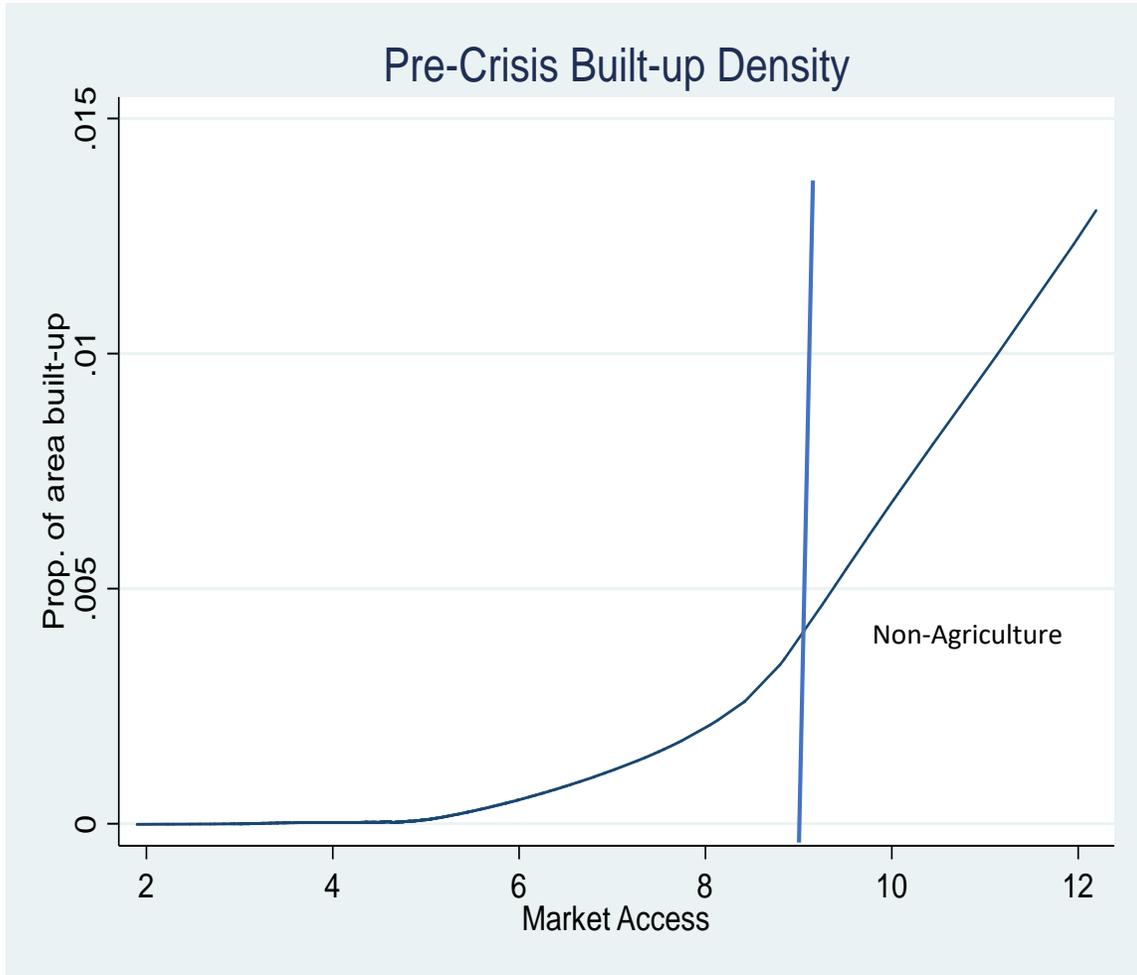
Conceptual Framework

- Takes account of three distinguishing features of these landlocked poor economies
 - Co-existence of subsistence economy and a part that is integrated with international markets
 - Modern manufacturing is concentrated in the cities
 - Built-up density corresponds more directly with modern manufacturing
- Two cities: one trades through Abidjan and the other through alternative West African port (s)
- Three products: two types of manufacturing (z) and (m), and agriculture (x); and one services: housing
- Free mobility of people
- Iceberg Trade cost
- Agglomeration externality (productivity function of population density)

Specialization Pattern during pre-crisis year

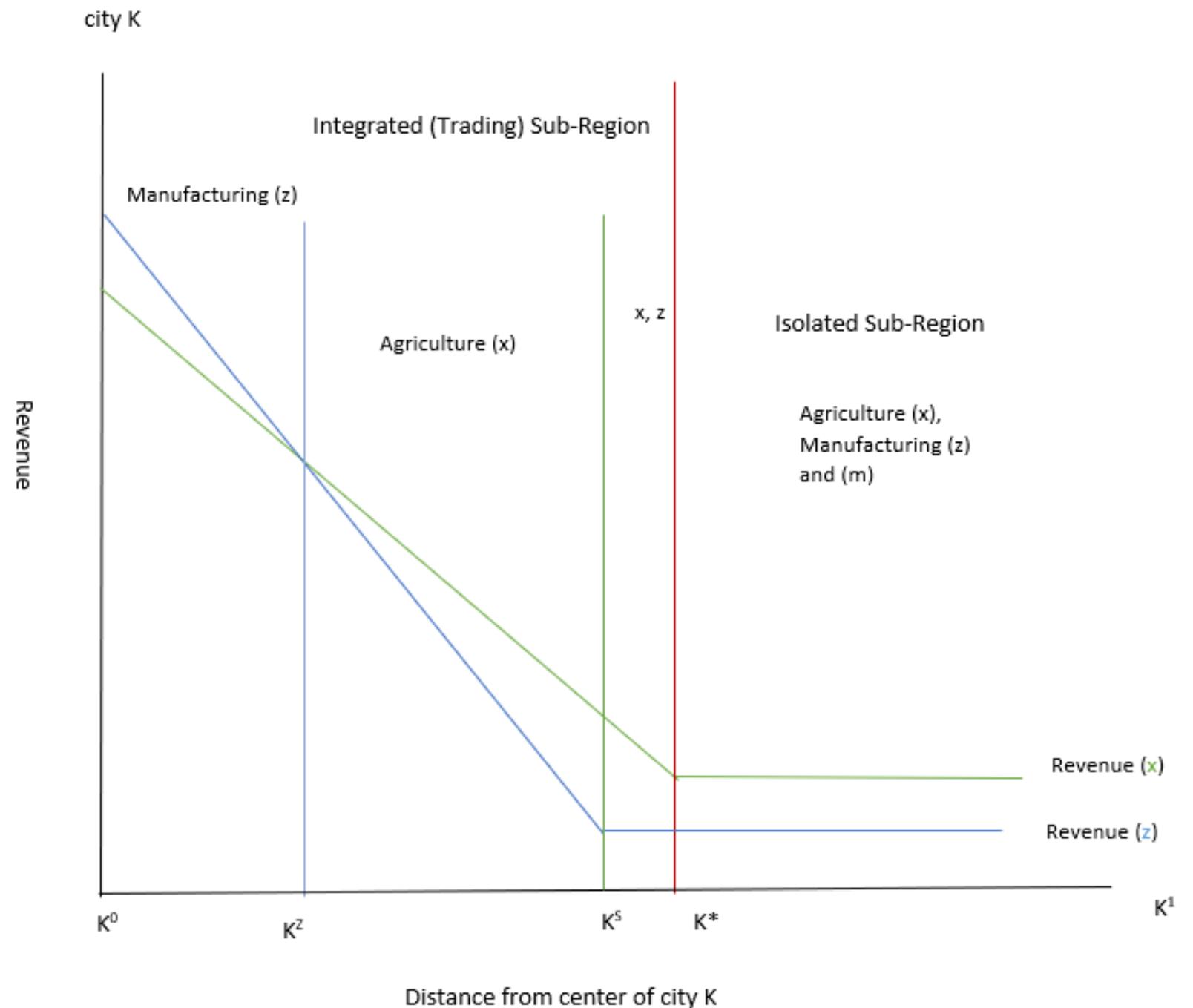


Built-up and population densities during pre-crisis years



Pre- crisis equilibrium

- Market access decreases with an increase in distance from city
- Spatial margin of trade: K^*
- Spatial margin of specialization: K^Z
- Negative shock to port access: price of import increases and export decreases



Impacts of CIV civil war

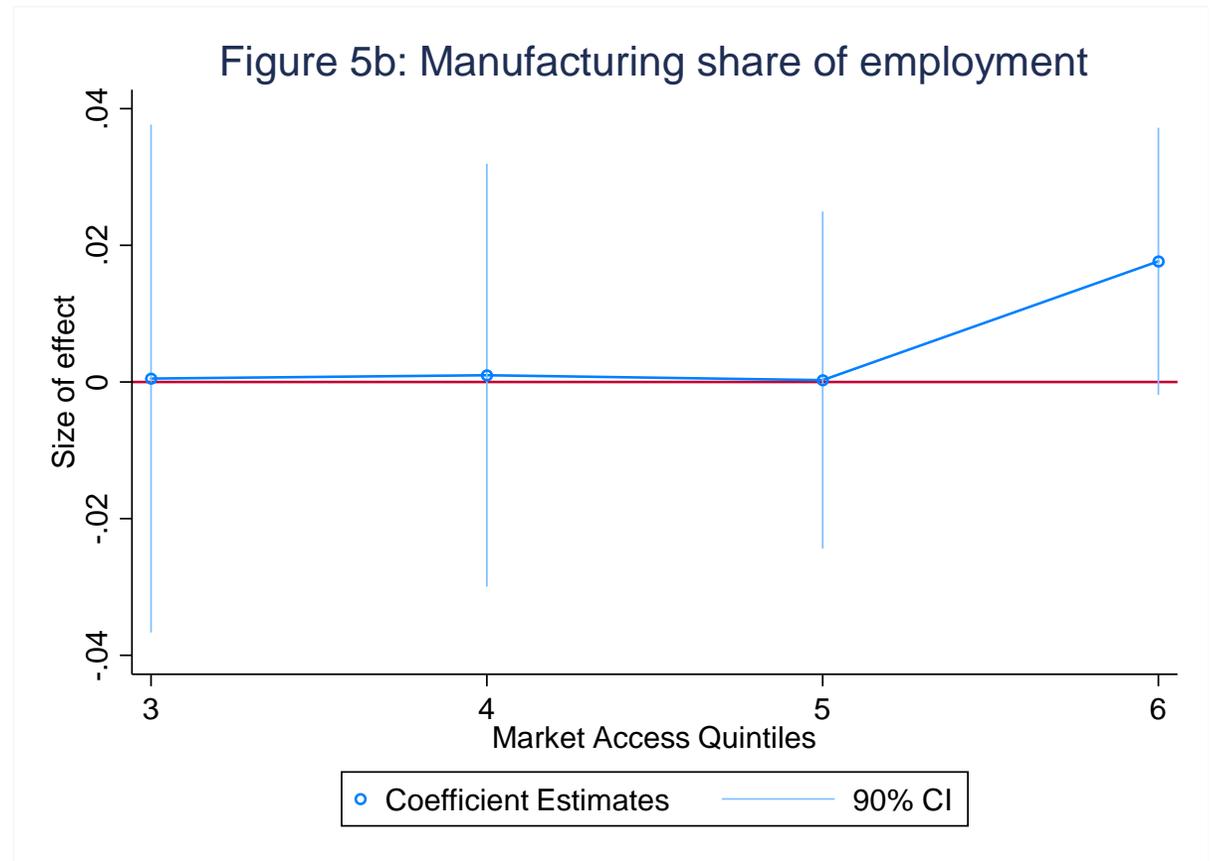
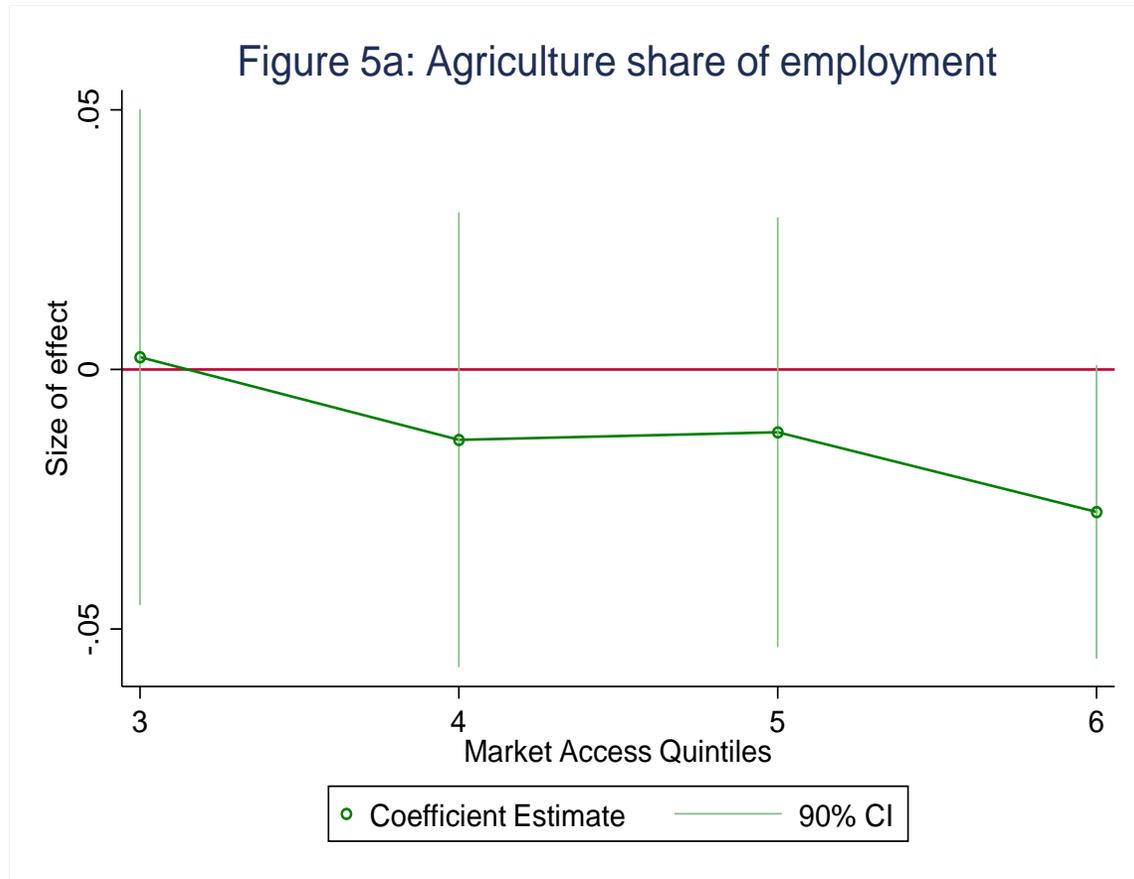
- Impacts depends on how these margins are affected by trade shock
- Potential control areas for impact evaluation
- Clear predictions about heterogeneity of impacts with respect to pre-crisis market access
- Spatial Substitution between household-based and modern manufacturing, with little average effect
- Built-up density and indicators of agglomeration responses similar to modern manufacturing.

Empirical Estimation

- Pooled census and satellite data on human settlements and nightlights from both countries to create a panel with years before, during and after Crisis (about 1000 communes/departments)
- DiD estimates with non-Abidjan routes as treatment and Abidjan route as comparison. Regressions include commune level fixed effects. Standard errors clustered at route level
- Checked if specialization pattern, built-up density, infrastructure provision and human capital different between two routes during pre-crisis period. Parallel trends assumptions hold during pre-crisis spatial equilibrium

Locating the autarkic region

- No change in employment pattern in regions that were and are subsistence economy before and after war



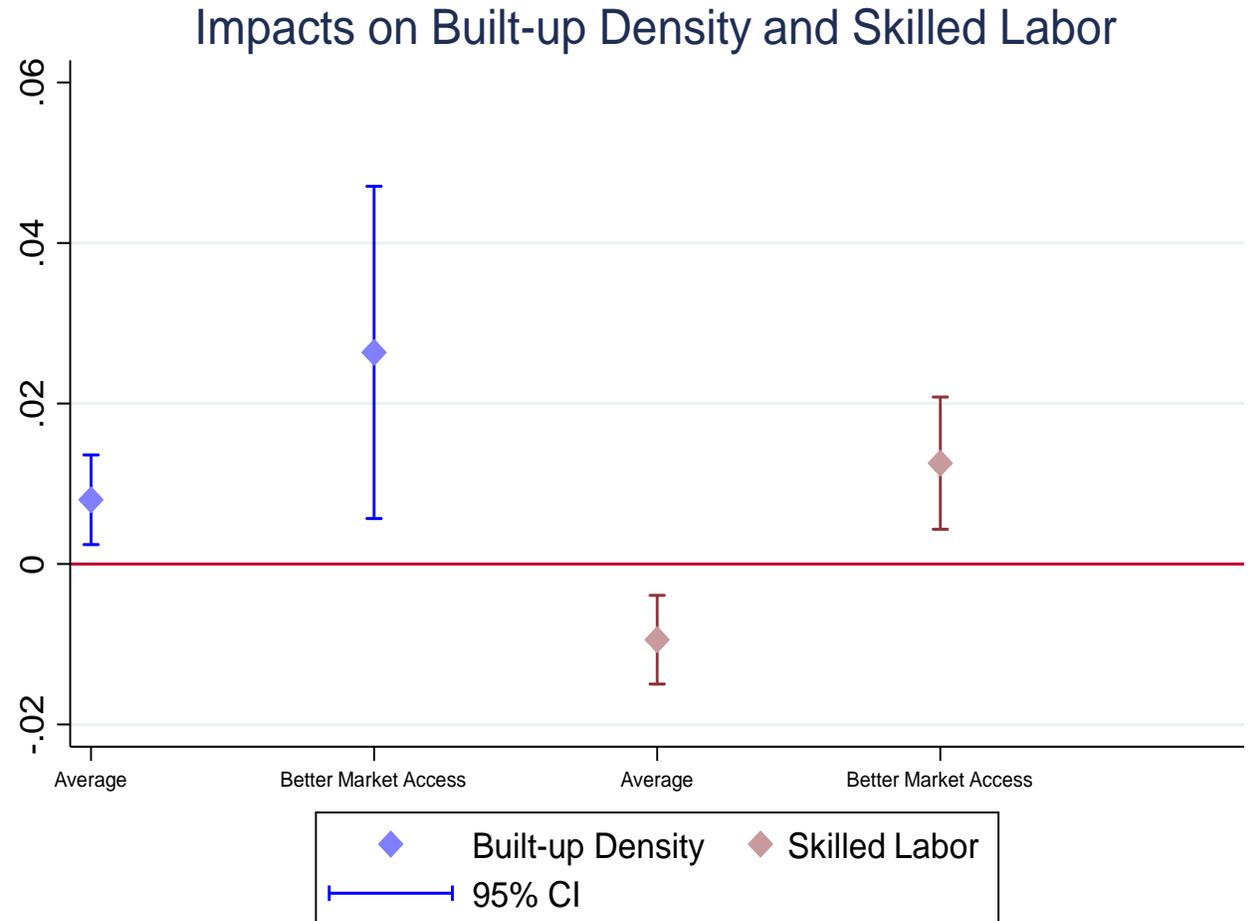
Impacts on spatial specialization

- DiD estimates (Autarkic Region as comparison)
- Changes in employment pattern: expansion of manufacturing closer to areas with better pre-war market access, declining elsewhere leading to a decline in its average share
- About 60% of communes were subsistence based during pre-war
- How many communes started to engage in long-distance trading: from 261 to 392 along non-Abidjan routes and no change in Abidjan route



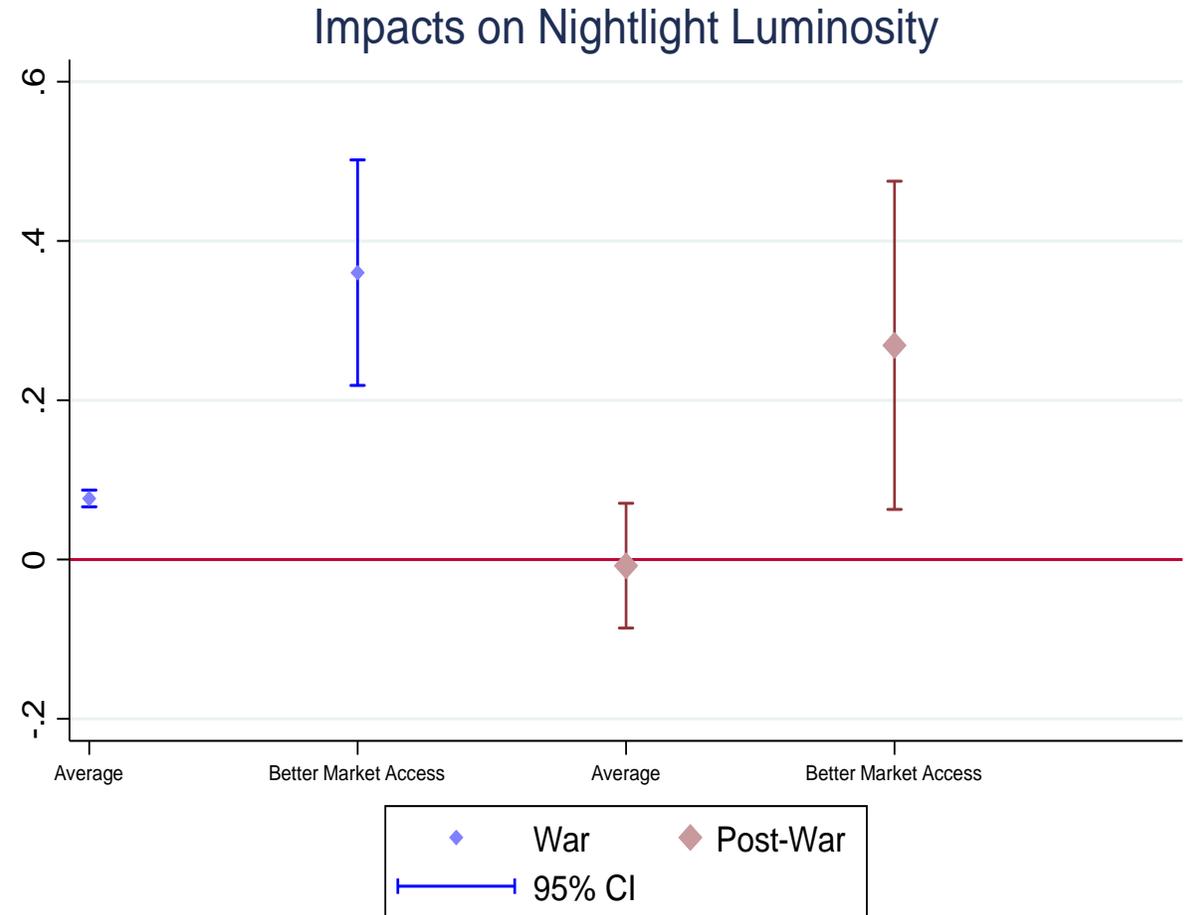
Short-term Shock, long-term persistence? Built-up Density and Skilled Labor Agglomeration

- Global Human Settlement Layer Data (1990, 2000, 2014)
- Average effect is positive and statistically significant but small in magnitude
- Areas with pre-war better market access: larger effect; significant growth in proportion of built-up areas
- Same pattern holds for skilled workers (and population density), an important source of agglomeration



Evidence from Nightlights

- Nightlights Data (1992-2014)
- Take nightlights as an indicator of expansion of electricity (infrastructure investment)
- Distinguish between war and post war period
- Increase during war-time much higher in areas with better market access



Conclusions

- Shifts in Spatial Edges of Trade and Specialization: key to understanding the change in spatial pattern of specialization
- Long term persistence in effects: Driven by Built-up density associated with modern manufacturing, skill agglomeration and infrastructure investment
- Methodological Point: In a Developing Country with less Developed infrastructure, part of the Autarkic region is unaffected by trade shocks and provides a plausible counterfactual