

# Cruise Ship Ports & Female Educational Attainment Evidence from Quintana Roo, Mexico

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## ABSTRACT

The cruise ship industry, the fastest-growing segment in the leisure travel market, has contributed significantly to the economic transformation of developing countries, particularly in the Caribbean Basin. This paper applies a difference-in-differences methodology to examine the causal impact of the introduction of cruise ship ports on human capital development in Mexico, as reflected by educational attainment. Using variations in school enrollment, segregated by gender and age across states and municipalities, I find that the economic consequences derived from this form of tourism do not translate into incremental, permanent improvements in all quality of life indicators considered, most saliently in schooling. These results are consistent with those obtained by recent studies to the effect that the creation of low-paying, low-skilled positions by export activities has a detrimental impact on school enrollment as the opportunity costs outweigh returns to education. They also corroborate other research postulating that in regions relatively more affected by international tourism the local expansion in services is offset by reduction in other forms of economic activity.

## RESEARCH QUESTION

Whether cruise ship ports contribute to the development of human capital as measured by school enrollment?

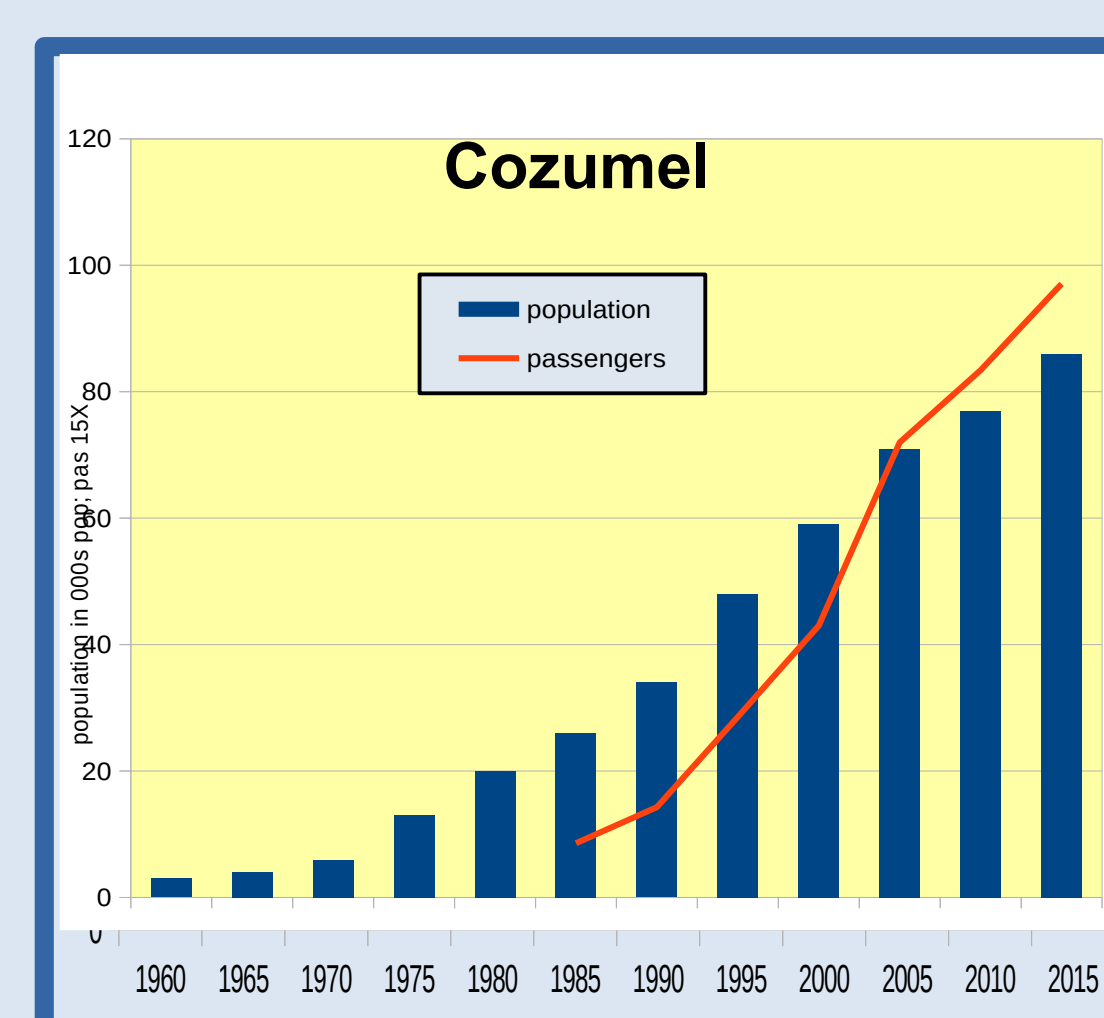
## SETTING

### State of Quintana Roo

- The state's total population has increased 300% since 1990.
- Over 44% of locals considered themselves of Mayan heritage.
- Two notable anomalies are observed in Quintana Roo: remittances from the United States are not a significant contributor to its prosperity and over half of the population was not born in the state.

### Municipality of Cozumel

- Isolated, rocky island devoid of factors of endowment factors such as minerals, agriculture or industry
- Blessed by year-round pellucid, warm water, arresting coral reefs, and abundant marine life, Cozumel is considered one of the world's premier diving destinations.
- Women constitute the majority of the population and head 26% of households.



Source: INEGI, SECTUR

## INTERVENTION

- Cruise port operations date from 1968. However, it was not until 1994 with the construction of the Maya Pier and Maya Plaza, as part of a Mexican government initiative to foster tourism, that activities accelerated significantly.
- Cozumel is home to the world's fourth busiest cruise ship port.
- The economy of the island is based on tourism, a sector that accounts for 90% of service jobs.
- Women's share of these positions is almost double their representation in the aggregate national labor market.

Destination	Expenditures (US\$ Millions)	Employment	Wages (US\$ Millions)
Costa Maya	89	2081	13
Cozumel	474	11945	78

Source: BREA

## IDENTIFICATION STRATEGY

- The identification strategy relies on the observation that major cruise ship ports are located in only two out of the state's eleven municipalities.
- Variations in employment, tax revenues, and educational attainment can therefore be ascribed to specific tourist activities not present throughout the entire state.
- To measure the effects, I construct a data set that combines information pertaining to households for each municipality with aggregate data measuring the level of economic activity associated with the cruise ship ports.
- I then apply a difference in differences estimator that controls for systematic variation of education across municipalities.

## BASELINE SPECIFICATION

$$EAF_{it} = \beta_0 + \beta_1 \log(npassengers_{it}) + \beta_2 \log(ships_{it}) + \beta_3 \log(npassengers_{it} * avexppc_{it}) + \beta_4 \log(EAF_{it-1}) + \alpha + \theta + \varepsilon$$

$EAF_{it}$  = female educational attainment for location  $i$  at time  $t$  (non mandatory plus vocational training)\*

$npassengers_{it}$  = number of visitors from cruise ship\*\*

$ships_{it}$  = number of ships visiting port\*\*

$avexppc_{it}$  = average expenditure per passenger at site\*\*\*

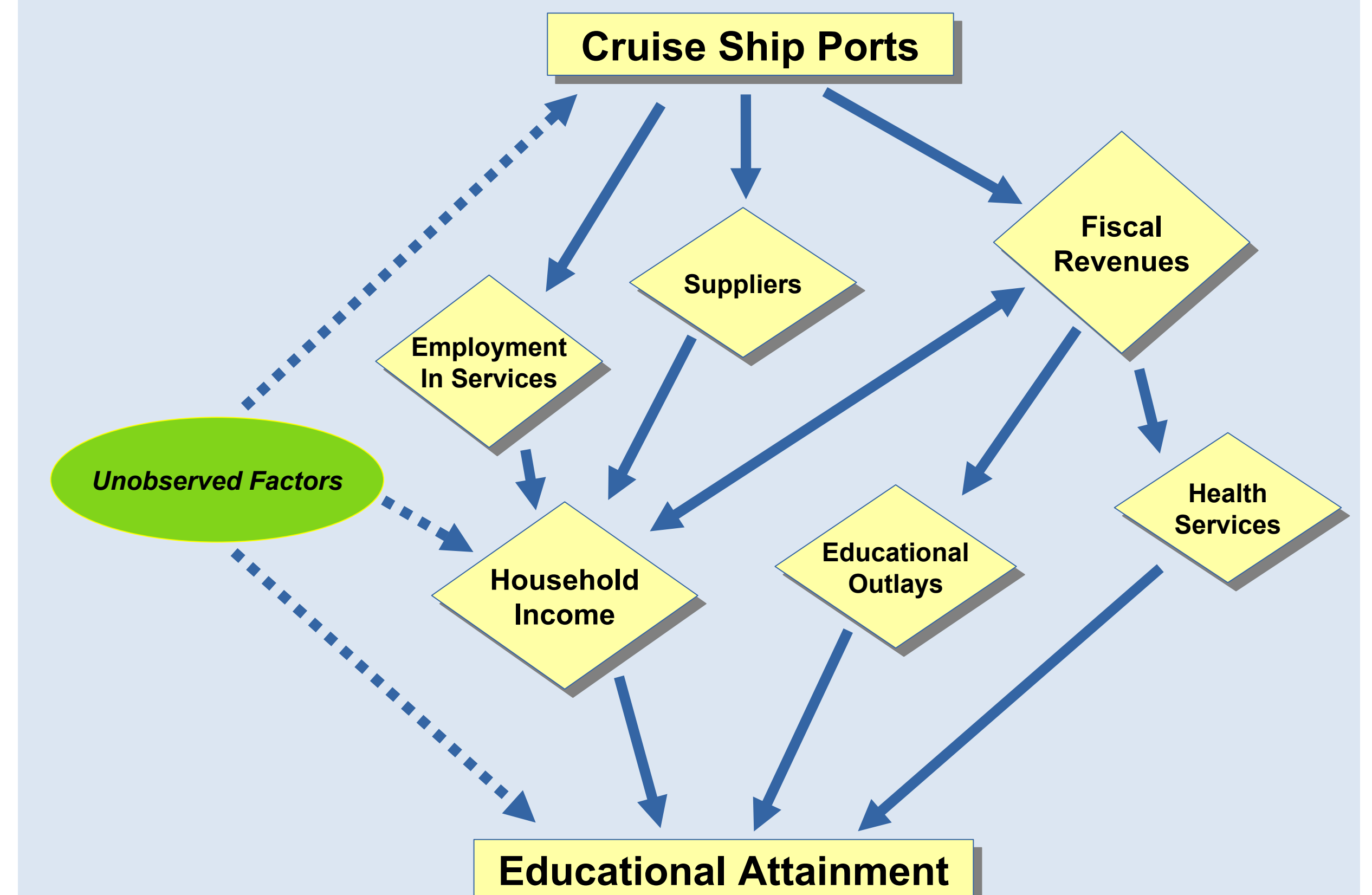
$\alpha$  = municipality fixed effects;  $\theta$  = time fixed effects;  $\varepsilon$  = error

Data Sources: \*INEGI, \*\*SECTUR, \*\*\*BREA

## POLICY IMPLICATIONS

Opportunity costs of schooling for low paying, low skilled positions appear to outweigh economic returns associated with further educational attainment. As such, programs designed to incentivize continued enrollment are needed; proceeds derived from cruise tourism (e.g., taxes and port fees) constitute a potential source for bankrolling these initiatives.

## DIRECTED ACYCLICAL GRAPH



**Hypothesis:** Ports affect educational attainment via two mechanisms, household income and fiscal revenues

## RESULTS

Dependent Variable:	Quintana Roo	Baja California Sur	Baja California
Log School Enrollment			
Log Number of Cruise Passengers	-0.027 (0.017)	-0.006 (0.013)	0.037 (0.032)
Constant	9.866*** (0.193)	9.642*** (0.067)	11.092*** (0.421)
R-squared	0.980	0.999	0.999
Observations( periods*mun)	168	55	55
Log Lag Number of Cruise Passengers	-0.033* (0.015)	-0.008 (0.017)	0.014 (0.027)
Constant	9.879*** (0.065)	9.889*** (0.128)	11.284*** (0.071)
R-squared	0.982	0.999	0.999
Observations( periods*mun)	148	50	50
Log Mean Number of Cruise Passengers	-0.034 (0.020)	-0.023 (0.036)	0.042 (0.036)
Constant	9.894*** (0.094)	10.015*** (0.275)	11.208*** (0.095)
R-squared	0.982	0.999	0.999
Observations( periods*mun)	148	40	40
Log Geometric Mean Number of Cruise Passengers	-0.019* (0.009)	-0.085 (0.051)	0.028 (0.028)
Constant	9.802*** (0.052)	10.466*** (0.384)	11.243*** (0.073)
R-squared	0.990	0.999	0.999
Observations( periods*mun)	116	55	55

Standard errors in parentheses. All errors are clustered at the municipality and survey year level.

\*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

## INTERPRETATION

- ◆ Impact of intervention is not uniform throughout geographical space (both within and between states).
- ◆ Statistical significance is weak particularly at national level.
- ◆ Magnitude of correlation is relatively small and mostly inversely aligned with the number of passengers arrivals.
- ◆ Age and gender are not for the most part contributing factors.
- ◆ Cruise activity is strongly related to wage gains.
- ◆ Secular trends in population and income growth dominate thus indicating that cruise tourism *per se* does not provide additional stimulus to school enrollment.