

*Offshore Financial Centers:
Parasites or Symbionts?*

Andrew K. Rose and Mark M. Spiegel

Introduction

Offshore financial centers (OFCs): jurisdictions that oversee disproportionate non-resident financial activity.

We examine two questions:

1. Why do some countries become OFCs?
2. What are consequences of OFCs to their neighbors?

Determinants of OFCs

1. Bilateral data from over 200 countries in the *CPIS*
2. Examine determinants of cross-border asset holdings for 2001 and 2002 using gravity model.
3. Confirm results with probit model, multilateral cross-section of over 200 countries for the same time period.
4. Find: Tax havens, money launderers more likely to be OFCs.
5. OFCs therefore facilitate bad source country behavior

Impact of OFCs on Source Countries:

1. OFC may increase competitiveness source country's banking
2. Theoretical model
 - Home country monopoly bank faces a competitive fringe of OFCs that offer tax advantages, subject to a fixed cost of moving assets offshore.

Impact of OFC Proximity

- General theoretical predictions are ambiguous
- Simulations suggest that proximity to OFCs have strong
- pro-competitive effects on the domestic banking sector
- Results are confirmed in empirical tests

Determinants of Offshore Financial Centers

1. Literature suggests that OFCs are created to facilitate circumvention of source country regulations [e.g. Hampton and Christensen (2002)]
2. In 2000, OECD identified 30 countries as engaging in harmful tax practices, and gave deadlines for avoidance of sanctions
 1. Most countries complied
 2. Countries still in violation as of 2004 include: Andorra, Liberia, Liechtenstein, the Marshall Islands, and Monaco
3. G7 has created task force against money laundering practices

Bilateral Approach

1. Use bilateral CPIS data for year-end 2001 and 2002, data set includes 69 source and 222 host countries
2. Gravity model specification
 - a. conventional gravity variables, including source and host country population, real GDP per capita, colonial history, geographic features, distance, common language, and common currency
 - b. Combination of 3 indicators on tax havens [OECD, CIA, and Hines and Rice (1994)].
 - c. Money laundering dummy from June 2000 OECD
 - d. variables that measure the rule of law, political stability, and regulatory quality

Gravity specification:

$$\begin{aligned} \ln(X_{ijt}) = & \beta_0 + \beta_1 \ln(D_{ij}) + \beta_2 \ln(Y_{it}) + \beta_3 \ln(Y_{jt}) + \beta_4 \ln(Pop_{it}) + \beta_5 \ln(Pop_{jt}) \\ & + \beta_6 Cont_{ij} + \beta_7 Lang_{ij} + \beta_8 CU_{ijt} + \beta_9 ComCol_{ij} + \beta_{10} Col_{ijt} + \beta_{11} Island_i \\ & + \beta_{12} Island_j + \beta_{13} Landl_i + \beta_{14} Landl_j + \beta_{15} \ln(Area_{ij}) + \beta_{16} \ln(Area_{it}) \\ & + \gamma_1 Taxh_i + \gamma_2 Taxh_j + \gamma_3 Moneyl_i + \gamma_4 Moneyl_j + \gamma_5 Rule_i + \gamma_6 Rule_j + \gamma_7 Pol_i \\ & + \gamma_8 Pol_j + \gamma_9 Reg_i + \gamma_{10} Reg_j + \gamma_{11} Common_i + \gamma_{12} Common_j + \gamma_{13} Civil_i \\ & + \gamma_{14} Civil_j + \gamma_{15} French_i + \gamma_{16} French_j + \varepsilon_{ijt} \end{aligned}$$

Table 1: Bilateral Determinants of Cross-Border Asset Holdings (summary)

| | Pooled | 2001 | 2002 | Pooled, without 0 values | Pooled, with institutions | Pooled, with institutions, legal regime |
|-------------------------------|----------------|----------------|----------------|---|--|--|
| Log Distance | -1.14 (.08) | -1.24 (.09) | -1.04 (.09) | -.49 (.05) | -1.23 (.08) | -1.13 (.08) |
| Tax Haven Host | | | | | 1.19 (.24) | 1.33 (.25) |
| Tax Haven Source | | | | | .70 (.20) | 1.23 (.22) |
| Money Launder Host | | | | | 2.06 (.24) | 2.06 (.24) |
| Money Launder Source | | | | | .55 (.23) | .29 (.23) |
| Regulatory Quality, Host | | | | | 2.19 (.15) | 2.21 (.15) |
| Regulatory Quality, Source | | | | | -.50 (.23) | -.06 (.24) |
| Observations | 12,220 | 6,364 | 5,856 | 6,063 | 12,220 | 12,220 |
| R ² | .56 | .54 | .57 | .54 | .60 | .60 |

Summary of Bilateral Results

- a. Higher population and GDP per capita in either the source or host countries encourage greater cross-holdings
- b. Geography matters: distance lowers cross-holdings, while a shared border, language, or money raises them
- c. Host countries that are tax havens and/or money launderers are more likely to attract cross-holding
- d. Host countries with higher regulatory quality attract more assets

Multilateral evidence on OFC Determination

1. Cross-sectional probit
2. Identification of OFCs
 - a. Identified as financial center by either Financial Stability Forum, Errico and Musalem (1999), or IMF (2004)
 - b. host at least \$10 million in total assets
 - c. Not in OECD
 - d. Results in forty OFCs

Offshore Financial Centers: Default Definition

| | | | |
|-------------|----------------|-----------|----------------------|
| Andorra | Aruba | Bahamas | Bahrain |
| Barbados | Belize | Bermuda | Brit. Virgin Islands |
| Caymans | Costa Rica | Cyprus | Dominica |
| Gibraltar | Guernsey | Hong Kong | Isle of Man |
| Israel | Jersey | Kuwait | Lebanon |
| Liberia | Liechtenstein | Macau | Malaysia |
| Malta | Marshalls | Mauritius | Monaco |
| Morocco | Neth. Antilles | Oman | Panama |
| Philippines | Russia | Singapore | St. Kitts & Nevis |
| Thailand | Turks&Caicos | U.A.E. | Uruguay |

Table 2: Multilateral Determinants of OFCs

| | (1) | (2) | (3) | (4) |
|-----------------------|---------------|---------------|---------------|---------------|
| Population | -.11 (.04) | .11 (.06) | .01 (.09) | .01 (.10) |
| GDP p/c | .44 (.11) | .39 (.13) | .35 (.30) | .49 (.31) |
| Tax Haven | | 1.34 (.36) | 1.05 (.43) | .87 (.45) |
| Money Launderer | | 1.51 (.35) | 1.87 (.48) | 1.87 (.48) |
| Rule of Law | | | -.24 (.50) | -.39 (.52) |
| Political Stability | | | -.13 (.29) | -.07 (.31) |
| Regulatory Quality | | | .32 (.46) | .32 (.46) |
| Common Law | | | | -.05 (.50) |
| Civil Law | | | | -.94 (.60) |
| French Law | | | | .60 (.44) |
| Observations | 223 | 223 | 184 | 184 |
| Pseudo-R ² | .16 | .42 | .41 | .44 |

Multilateral Results

- a. Being either a tax haven or a money launderer has an economically and statistically strong effect in raising the probability of being an OFC. (Confirms bilateral results)
- b. measures of institutional quality and the legal regime have no strong consistent effect on OFC determination.
- c. Results are robust to extensive sensitivity analysis
- d. Suggests that primary motivation for investors in moving assets offshore is circumvention of domestic tax laws or other illegal activities.

Consequences of Offshore Financial Centers

A. Simple Theoretical Model of OFC Activity

1. Assumptions

- a. Source country populated by a continuum of depositors, ($i=1 \dots m$), endowed with initial wealth, $w(i)$.
- b. Number depositors such that $w(i) \leq w(i+1)$
- c. Depositors hold three assets:
 1. onshore deposits that pay r_H
 2. offshore deposits that pay r_O
 3. outside alternative that yields exogenous r^*

d. There is a fixed cost, denoted ax , of making an offshore deposit, where a is a constant and x represents the “distance” from the home country to the offshore country.

e. Returns on domestic savings are taxed at rate τ , while offshore savings enjoy a tax advantage, represented by a constant term θ .

f. Offshore bank acts as a competitor and Stackelberg follower

2. System of 2 Equations

a. Zero profit condition of offshore bank

$$\theta w(i^*)R = r^* w(i^*) + ax$$

b. First order condition of source country bank

$$R - r^* + R' L_H = 0$$

3. Comparative Static Results

a. Increases in θ raise offshore lending and reduce home country bank lending, but less than one for one.

b. OFC lending is decreasing in distance to home country, x .

4. Limit Pricing

- a. Instead of pursuing the interior solution above, home country bank can “limit-price” by issuing sufficient loans that the OFC can not compete in the home market.
- b. Condition for limit pricing shows that domestic lending level needed to achieve limit pricing is decreasing in x
- c. At sufficient x , level necessary to achieve limit pricing may be less than pure monopoly solution (which would yield higher profits)

- d. Therefore have 3 ranges for solution for home country bank as x increases:
 - a. Head-to-head competition with OFC as Stackelberg leader
 - b. Limit pricing
 - c. Pure monopoly solution

5. Home Country Welfare

a. Measure welfare as net gains from intermediation relative to placing all deposits in bond

$$W = \int_0^L [R(l) - r^*] dl - (m - i^*)ax$$

b. Two components

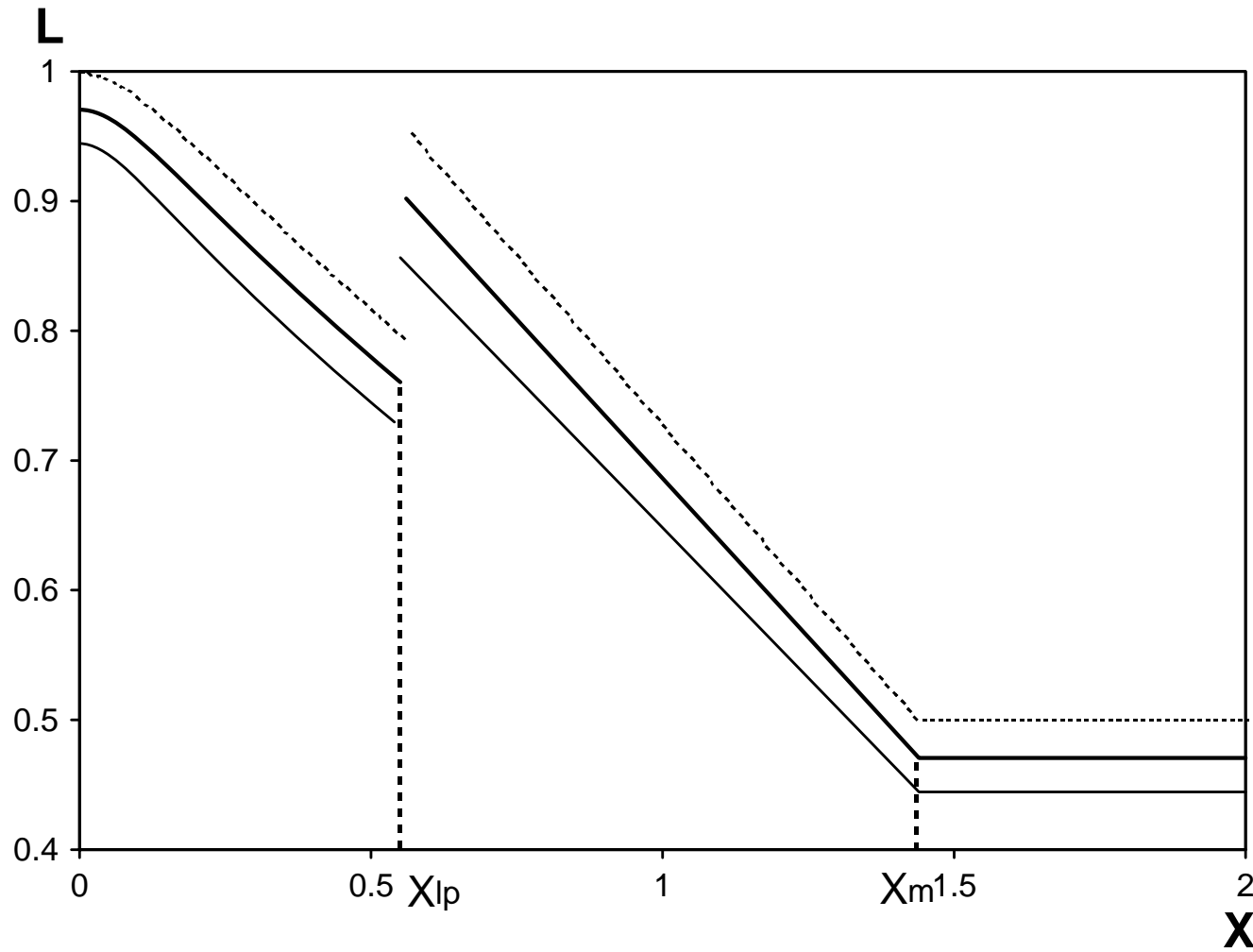
1. OFC induces the home country bank to behave more competitively, increasing lending and overall welfare.
2. Depositors take their funds offshore for purely redistributive reasons (cut taxes). Resource cost of moving those assets offshore is a deadweight loss.

c. Overall welfare impact of OFC-proximity is ambiguous.

Simulations

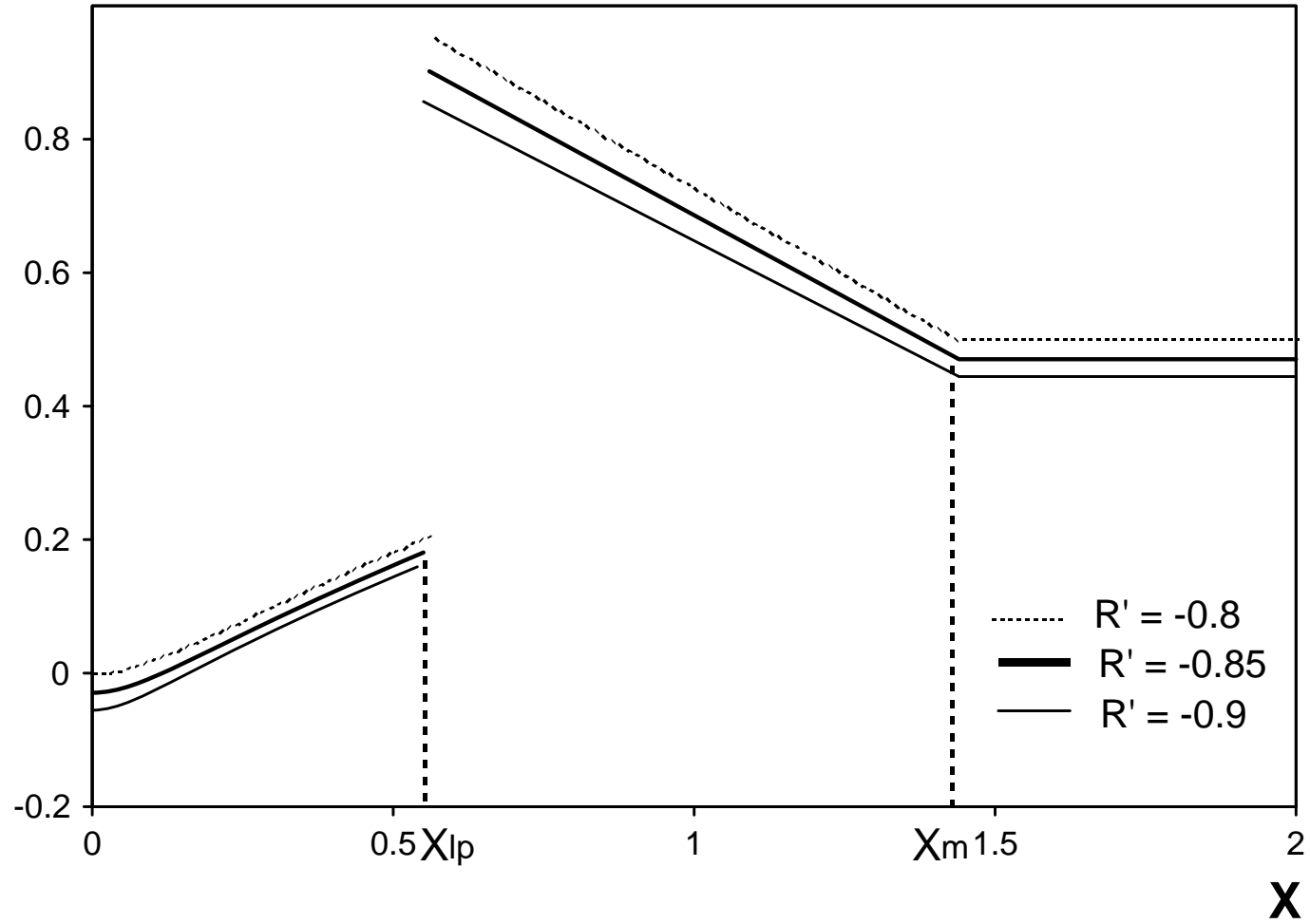
1. To allow for analytic solution, linearize $w(i)$ and $R(L)$
2. Parameterize the model by setting $r^*= 1.2$, $\theta=1.2$, (but examine alternative values), $a= 1.0$, $w= 2.0$
3. Normalize $m=1$, which implies that the equilibrium value of i^* represents the share of depositors who do not take their assets offshore.
4. Finally, normalize local interest rates by setting \bar{R} equal to 2.0 and R' equal to -0.85 (but examine alternative values).

Distance to OFC and Overall Lending

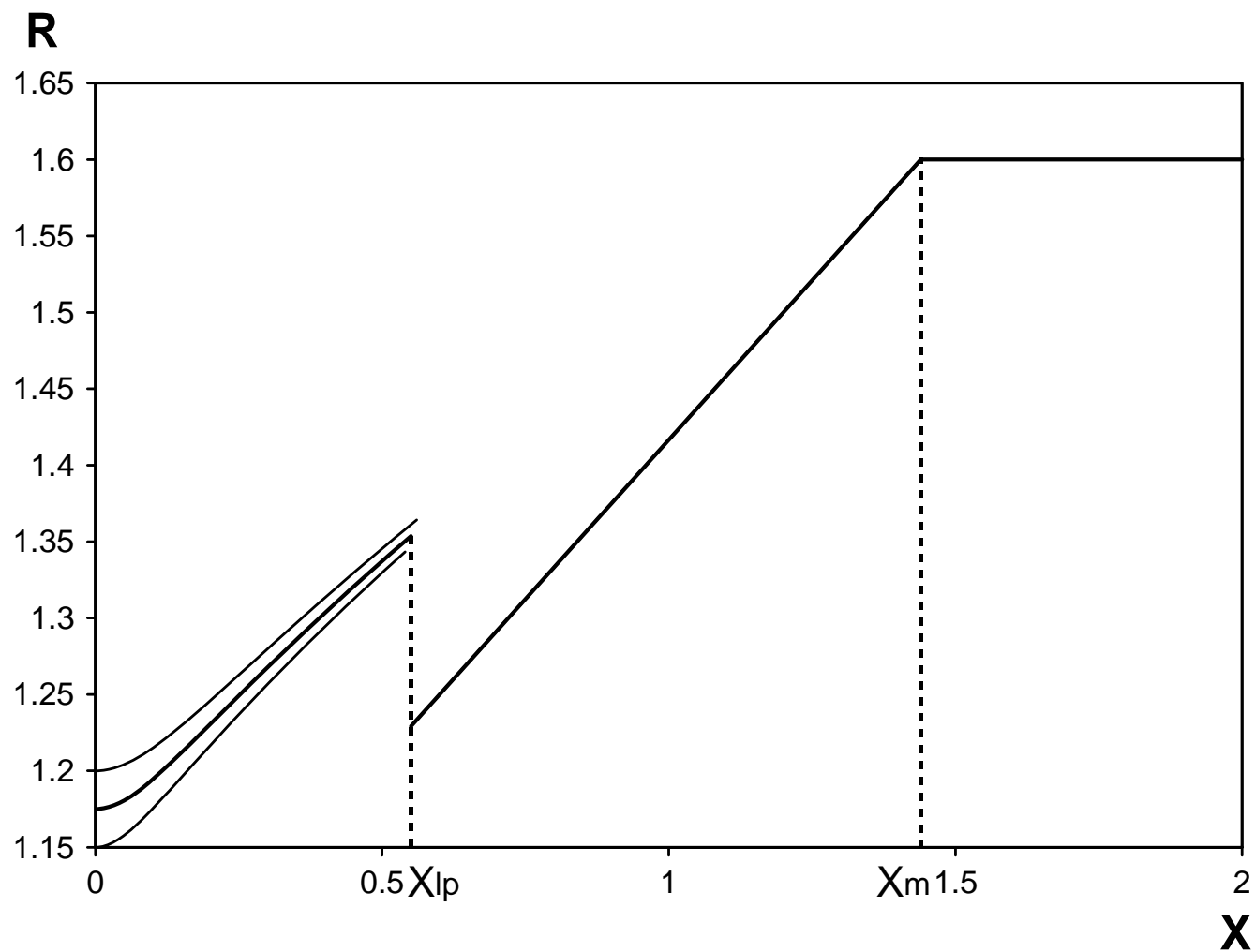


Distance to OFC and Home Bank Lending

Lh

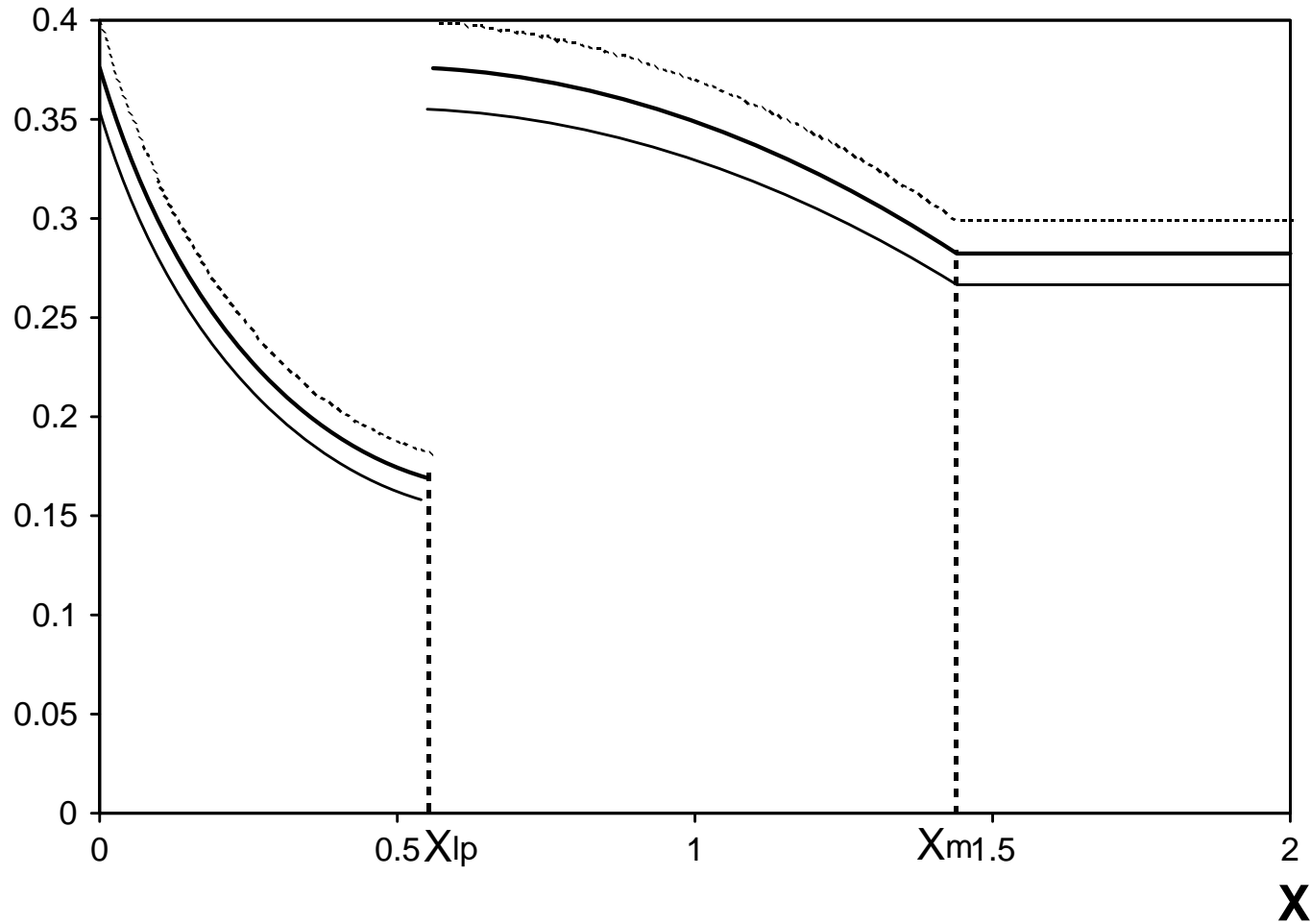


Distance to OFC and Source Country Interest Rate



Distance to OFC and Source Country Welfare

Welfare



Impact of OFCs on their Neighbors

A. Examine theory predictions that home country profits are declining and that overall lending is increasing in OFC proximity

1. Use multilateral data from above
2. Proximity is measured as distance to nearest OFC
3. Base specification conditions on population and real GDP per capita, as well as OFC dummy
4. Add a number of conditioning variables to check sensitivity, including legal regimes based on Civil or French Law, hours of latitude, a landlocked nation dummy variable, and the percentage of population that is Christian or Muslim.
5. Remoteness, defined as the average (log) distance between i and (log) GDP in the rest of the world
6. Estimate using OLS, with standard errors robust to heteroskedasticity.

B. Estimating equation takes the form:

$$y_i = \beta \ln(\min DistOFC)_i + \gamma_0 + \gamma_1 OFC_i + \gamma_2 \ln(Pop)_i + \gamma_3 \ln(Y/Pop)_i + Controls + \varepsilon_i$$

C. Impact of OFC proximity on domestic banking competitiveness

○ 3 measures of the degree of competitiveness

a. interest rate spread charged by commercial banks

b. concentration of domestic banking, share of top 5 banks

c. number of banks divided by the log of domestic GDP

○ Coefficient of interest to us is β , the effect of OFC proximity on domestic banking competitiveness

Table 3a: OFC Proximity & Domestic Banking Competitiveness

| Measure | Bivariate | Controls #1 | Controls #2 | Controls #3 | IV |
|---|------------------|------------------------|------------------------|------------------------|----------------|
| Loan-Deposit Interest Spread | 2.21 (.62) | 1.45 (.69) | 1.41 (.70) | 1.63 (.79) | 1.44 (.92) |
| 5-bank Concent. Ratio | 1.77 (1.75) | 4.66 (1.38) | 7.53 (1.79) | 6.91 (1.98) | 8.22 (2.86) |
| # Comm. Banks /ln GDP | -.67 (.68) | -.99 (.78) | -1.16 (.65) | -1.52 (.81) | -1.49 (.89) |

Coefficients recorded are for log distance to closest OFC.

Controls #1: OFC dummy; log (2001-02 average) population; log (2001-02 average) real GDP per capita; intercept.

Controls #2: controls #1 plus trade remoteness; civil law dummy; French law dummy; landlocked dummy; latitude in hours; % Christian; % Muslim.

Controls #3: controls #2 plus (2001-02 average) trade as a percentage of GDP.

IV: controls #3. IVs for log minimum distance to OFC include: 1) log minimum distance to tax haven; 2) log minimum distance to money launderer; 3) remoteness from OFCs.

OLS estimation unless labeled; robust standard errors recorded in parentheses.

Summary of Results

1. OFC remoteness associated with an increase in monopoly power at statistically and economically significant levels.
 - a. Point estimates suggest that a one standard deviation increase in distance to an OFC is associated with an increase of 1.41 to 2.21 percent in the interest rate spread and an increase of 1.77 to 8.22 percent in the share of the banking industry controlled by the five largest commercial banks.
 - b. These results are statistically significant at standard significance levels for all three specifications.

Impact on Depth of Domestic Financial Intermediation

A. Use 3 measures of intermediation common in literature

1. ratio of credit to the private sector as a percentage of GDP
2. ratio of quasi-liquid liabilities to GDP
3. ratio of M2 to GDP

B. Coefficient of interest, β , expected to be consistently negative, since OFC proximity should increase domestic financial intermediation.

Table 3b: OFC Proximity and Financial Depth

| Measure (% GDP) | Bivariate | Controls #1 | Controls #2 | Controls #3 | IV |
|-----------------------------------|------------------|--------------------|--------------------|--------------------|---------------|
| Dom. Private Sector Credit | -13.7 (3.6) | -1.9 (3.0) | -3.1 (2.9) | -4.1 (3.1) | -3.4 (3.4) |
| Quasi-Liquid Liability | -16.3 (4.2) | -8.9 (3.3) | -11.4 (3.6) | -11.6 (3.4) | -7.8 (3.2) |
| M2 | -17.1 (4.1) | -9.7 (3.4) | -11.1 (4.0) | -11.5 (3.8) | -5.3 (3.7) |

Coefficients recorded are for log distance to closest OFC.

Controls #1: OFC dummy; log (2001-02 average) population; log (2001-02 average) real GDP per capita; intercept.

Controls #2: controls #1 plus trade remoteness; civil law dummy; French law dummy; landlocked dummy; latitude in hours; % Christian; % Muslim.

Controls #3: controls #2 plus (2001-02 average) trade as a percentage of GDP.

IV: controls #3. IVs for log minimum distance to OFC include: 1) log minimum distance to tax haven; 2) log minimum distance to money launderer; 3) remoteness from OFCs.

OLS estimation unless labeled; robust standard errors recorded in parentheses.

Summary of Results

1. Distance to the closest OFC affects financial intermediation with a consistently negative sign
2. Significant for two of our three proxies, the ratios of quasi-liquid liabilities to GDP and M2 to GDP, but insignificant effect on credit to the private sector as a percentage of GDP
3. Point estimates indicate that proximity to an OFC is consistently of economic significance

Conclusion

- Examine determinants of offshore financial centers (OFCs), consequences of OFCs for neighbors
- Successful OFCs encourage bad behavior in source countries, facilitate tax evasion and money laundering
- But OFCs also have unintended positive consequences, enhance the competitiveness of local banking sector
- Derive model where OFC proximity enhances the competitive behavior of the monopoly bank, may increase overall welfare
- Empirically, show OFC proximity associated with more competitive domestic banking, greater financial intermediation.
- Tentatively conclude: OFCs are better characterized as “symbionts”