

Comments : Evaluating the impact of
outbound FDI on
domestic investment
:A difference-in-differences matching
approach

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Part I : The study

- **Objectives** : The impact of investing abroad by firms from an emerging economy on the growth in domestic investment.
- **Emerging economy in focus** : India
- **Theoretical hypothesis**: Unpredictable
- **Data** : PROWESS data of 1688 firms (Table 4) across various sectors over the period 2000-2006.
- **Methodology**: Propensity score matching method based on nearest neighbour matching techniques.

- **Results** : Firms with low investment abroad witness an increase in investment at home after three years. Firms with high OFDI substitute foreign investment for domestic investment.
- **Observation** : The lower cost of capital abroad and financial markets segmented by capital controls do not allow firms to bring cheaper capital back to invest at home. Activity thus shifts abroad and growth in investment domestically is slower (Introduction)
- **Policy implication:** Relax capital controls

Part II: Comments and suggestions

- Theoretical Issues
- Methodological Issues

Theoretical issues

- Theoretically, the study draws heavily on Desai et al (2005). The framework is developed for OECD countries and needs to be adapted to fit in an emerging economy context.
- Desai et al assume,
$$Q = Q(K_d, K_f, P)$$

The first-order condition corresponding to profit-maximizing levels of domestic investment is :

$$\partial Q(K_d, K_f, P) / \partial K_d = \lambda(K_d, K_f)$$

in which λ is the firm's cost of capital which is function of both domestic and foreign capital as capital markets are internalised.

- If firm resources are fixed then, $\lambda (K_d, K_f)$ corresponds to $\lambda (K_d + K_f)$. Any increase in K_f leads to decline in K_d . Desai et al. argue that financial resources are not fixed. Therefore, no financial constraint and hence the relationship between K_f and K_d is not negative. They rule out interaction between K_d and K_f through this channel.
- In this setting if foreign capital is cheaper and there are no capital controls then the resources for DI are actually augmented. Domestic investment is thus likely to increase with increase in foreign investment (a possibility not discussed by Desai et al, for the US firms)
- The present study argues that the markets are segmented due to capital controls. If so, how is the above function altered? Should the domestic investment be a function of cost of domestic capital alone in that case? This means that increase in foreign investment may not lead to less domestic investment but it may not augment resources for domestic I either.

But...

- Firms resources may actually be augmented through increased income flows (profit repatriation) and firms' growth. FDI outflows might indicate that domestic investment opportunities are poor and OFDI might be to reap more profitable foreign opportunities.
- In addition, OFDI may be associated with increased competitiveness and increased efficiency of domestic investment. This may increase domestic investment at given cost of capital. This possibility cannot be ruled out as a large part of India's OFDI is strategic asset seeking : skilled labour, technology both soft and hard.
- Thus the framework given by Desai et al. may be adapted by discussing these possibilities in India's context.

Further...

- Desai et al argue that “If financial resources are not fixed, then the primary source of interaction between foreign and domestic investment comes from the production process” (p.3). Thus it depends on the sign of

$$\partial^2 Q(K_d, K_f, P) / \partial K_d \partial K_f$$

- According to them it is negative for horizontal FDI and positive for vertical FDI.
- .
- Vertical investment is generally, efficiency seeking. But, is horizontal investment always trade substituting? Horizontal OFDI may be to diversify and expand markets.
- Discuss this proposition in India's case.

In sum...

- Theoretically, OFDI may lead to higher domestic investment in an emerging economy by
- Improving competitiveness of domestic investment
- Expanding markets
- Providing cheap resources (in the case of resource seeking investment).
- Augmenting resources.

Methodological Issues

- PSM method using “R” package (needs to be mentioned clearly).
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- Requires the following steps:
- **Step 1:** Identifying treatment and control groups.
- Treatment groups : firms with high OFDI and firms with low OFDI
- Control groups are not clearly defined. Table 4 indicates that when the treatment group is High OFDI firms, the rest are control firms and when low OFDI firms are the treatment group all other firms including high OFDI firms are control groups.
- Suggestion : It is advisable to define the control groups neatly. They should be restricted to untreated units.

Step 2: Propensity score function

- Logit (Total assets, domestic assets, age, sales and wages) are measured in logs.
- In 2000, total assets could be proxied by domestic assets. It is assumed that the treatment was given in the post 2000 period. It may not be advisable to use it as a covariate.
- How is wages defined? Is that total wages? What is age?
- Important exclusions are Sector specific dummies, capital intensity, technology intensity, product differentiation, outward orientation (in terms of ownership, exports, imports, technology transfers)

Step 3: Common support region

- Is the pre-matching balancing property satisfied in the selected logit equations? Please discuss.
- Propensity density functions need to be plotted to check the common support areas?

Step 4: Matching

- Covariate-wise matching does not turn out to be satisfactory in particular in the case of high OFDI companies.
- Table 8 : t-statistics of the overall mean difference test is significant at 10%.
- Higher order matching tests may also be used : pseudo R2 tests, log-likelihood test
- A more comprehensive logit function might provide better results.

Step 5: Average treatment effects on treated units and sensitivity

- The final result yields ATT (treatment effects on treated units)
- The use of short form “ATE” is technically wrong.
- The magnitude of coefficients is also important in the results and needs attention.
- These effects vary quite widely across various methods of matching, in particular in the case of high OFDI. The results are thus sensitive to matching technique.
- The results may be improved through better designing of the methodology at each step, as suggested above.

Finally,

PSM requires large databases. In this case, observations on treated units are rather few and the intervention year is rather vague.

Authors are encouraged to use regression techniques as well for the sensitivity analysis.

Thank You