

Sectoral Growth Effects of Cross-border Mergers and Acquisitions: a GMM estimation

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Abstract

We analyze the impact of cross-border mergers and acquisitions (M&A) sales as a mode of entry of multinational enterprises (MNEs) on economic growth. We break down cross-border M&A sales into primary sector, manufacturing, financial services and nonfinancial services flows, and consider each category's impact on aggregate growth, and growth in manufacturing and services. Using the GMM methodology we find that most economies benefit from service cross-border M&A sales. This is true irrespective of the geography and the level of income distribution of the economies. However, manufacturing M&A sales are likely to lead to deindustrialization in the manufacturing industries in low income economies, and hurt services growth in economies with large manufacturing shares. Primary sector cross-border M&A are growth enhancing in all country classifications but middle income countries.

The study reveals that to understand the interaction between growth and the mode of entry of capital flows it is crucial to disentangle the sectoral effects, and the type of investment.

Key Words: cross-border M&A, sectoral FDI, manufacturing and service growth, GMM

JEL Classification: G34 F2, F21, F43

1. Introduction

FDI became the most important foreign financing in most economies and its appeal is increasing as international capital flows dry out from financial markets following the 2008 financial crisis. Two recent developments in the nature of international capital flows accompanied the rise in their volume: (i) the emergence of service FDI, which has been gradually supplanting the manufacturing FDI, (ii) shift in the composition of FDI from “greenfield” investment (investment in new assets) towards cross-border mergers and acquisitions (acquisition of existing assets). The two developments are intimately related since the common entry mode of multinational enterprises’ (MNE) in services is through M&A (UNCTAD 2004).

These developments cause concern that this shift is not beneficial to host countries due to potentially higher labor costs without compensating technological spillovers to other industries. The greenfield investment is considered to stimulate growth via increase in physical investment, while M&A stimulates it via know-how and productivity increases. If the latter does not materialize, the country faces higher costs and no benefits from FDI inflows.

The mode of entry of FDI is scarcely analyzed and its growth impact is shaky. Evidence from the FDI literature suggests that the sectoral and industry level analysis is likely to contain answers to public concerns.¹ This study is the first one that addresses the growth effect of cross-border M&A at the sectoral level. It examines the growth impact at the aggregate and industry spillovers of three types of M&A sales: manufacturing, financial and non-financial service inflows.²

A voluminous literature assesses the growth effects of aggregate FDI (De Mello, 1997, 1999) and the determinants of cross-border M&A.³ Yet to our knowledge no study examines the sectoral growth effect of FDI’s mode of entry. Calderon, Loayza and Serven (2004) analyze the Granger-causality between the M&A and greenfield investment, and their causality with growth and physical investment. They find that

¹ See Doytch and Uctum (2008).

² Throughout the test we use the term “spillover” loosely and do not distinguish between spillovers due to change in factor productivity, knowledge/technology diffusion or scale economies. We term spillover any such externalities that MNEs introduce in the host country, which affect sectoral growth rates.

³Gorg, 2000, Very and Schweiger, 2001, Vasconcellos and Kish, 1996, Chen and Findlay, 2003, Rossi and Volpin 2004.

neither mode of investment leads to growth. Most FDI studies are tainted by heterogeneity and the endogeneity problems. Our approach and the data set address these potential biases while offering a first-hand inquiry into the sectoral growth-M&A nexus.

This study has several novel aspects. First, we conduct the analysis at the sectoral level and further disaggregate services M&A to control for heterogeneity of industries. Second, we use a sample with a long data span, a large number of countries, and the GMM methodology. We breakdown the sample into geographical regions, levels of development and the relative size of their manufacturing and services sectors. Our data and approach allow us to examine the dynamic interaction between the variables, control for endogeneity and cross-sectional dependence.

We find that insignificant growth effects of total M&A conceal important sectoral effects. M&A sales in financial and nonfinancial service sectors benefit a number of economies through direct growth effects into service industries or positive spillovers into the manufacturing industry. Manufacturing cross-border M&A sales stimulates growth in the full sample but hurts manufacturing growth in low income economies and the service industry in economies with large manufacturing basis.

2. Model

We adapt the traditional empirical Solow-Swan growth model⁴:

$$\log y_{it}^k = \beta_0 + \beta_1 \log(y_{i,t-1}^k) + \beta_2 x_{it} + \beta_3 f_{it}^j + \beta_4 D^t + \mu_i + \varepsilon_{it} , \quad (1)$$

where $\mu_i \sim i.i.d(0, \sigma_{\mu_i})$, $\varepsilon_{it} \sim i.i.d.(0, \sigma_{\varepsilon})$, $E[\mu_i \varepsilon_{it}] = 0$

y_{it}^k is real per capita income of country i at time t , f_{it}^j , the cross-border M&A /GDP. The superscript k stands for a *GDP index* ($k=$ GDP, manufacturing value added, and services value added) and superscript j represents *cross-border M&A index* ($j=$ primary sector M&A, manufacturing M&A, financial M&A, and non-financial service M&A).

Subscripts $i= 1, \dots, 60$ and $t= 1, \dots, 15$ describe the cross-sectional and time dimensions of the panel data, respectively.

⁴ For panel data estimation of the growth models see Islam (1995), Durlauf, Johnson and Temple (2004).

The control variables come from traditional determinants of Solow growth model. Thus, x_{it} is an augmented row vector of the control variables m_{it} (investment/ GDP), r_{it} (real lending interest rate), s_{it} (gross secondary school enrolment ratio), c_{it} (government consumption/GDP) and b_{it} (government stability), D^t is a row vector of 15 year-dummy variables, and μ_i is the country-specific effect.

When $j=k$, and $\beta_3 > 0$ capital flows are growth enhancing in their own target industry (e.g., manufacturing M&A into manufacturing sector). However, a sector-specific FDI can also have growth effect in another industry. A transfer of MNEs nontangible assets to domestically owned firms lowers the average cost curves of the latter and increases their productivity. This is a positive spillover, which occurs when $j \neq k$ and $\beta_3 > 0$. However, all spillovers are not positive and FDI can sometime harm domestic firms (Aitken and Harrison, 1997). This happens when imperfectly competitive domestic firms face competition from the foreign firm in the same market. The MNE can compete in quantity and capture some of the domestic market. The productivity of domestic firms declines as they move up their new average cost curve and spread their fixed costs over a smaller share of the market. A negative inter-industry spillover can also happen if the MNE that enters one industry drains resources from another industry, mainly in the form of skilled labor, attracted to higher compensations. In this case, the productivity of domestic firms in the other industry falls again because their cost curve shifts out. Both cases of negative spillovers would be translated into lower production, dampened growth in the industry and would be reflected in $\beta_3 < 0$.

3. Empirical Methodology and data

The Blundell-Bond system GMM uses both lagged level observations as instruments for differenced variables and lagged differenced observations as instruments for level variables. One set of instruments deal with endogeneity of regressors and another set with the correlation between lagged dependent variable and the induced MA(1) error term. We estimate the model with system GMM with external instruments, under two conditions:

- (i) The error term does not have second order autocorrelation

$$E[y_{i,t-s}^k (\varepsilon_{it} - \varepsilon_{i,t-1})] = 0 \text{ for } s \geq 2 \text{ and } t=3, \dots, T$$

$$E[x_{i,t-s} (\varepsilon_{it} - \varepsilon_{i,t-1})] = 0 \text{ for } s \geq 2 \text{ and } t=3, \dots, T$$

$$E[f_{i,t-s}^j (\varepsilon_{it} - \varepsilon_{i,t-1})] = 0 \text{ for } s \geq 2 \text{ and } t=3, \dots, T;$$

(ii) The unobserved country-specific effect is not correlated with regressors' differences,

$$E[(y_{i,t-1}^k - y_{i,t-2}^k)(\mu_i + \varepsilon_{it})] = 0$$

$$E[(x_{i,t-1} - x_{i,t-2})(\mu_i + \varepsilon_{it})] = 0$$

$$E[(f_{i,t-1}^j - f_{i,t-2}^j)(\mu_i + \varepsilon_{it})] = 0$$

Since there is no guideline to determine the optimal number of instruments, we use the minimum number of instruments based on 3 lags (Roodman, 2006). As a robustness test, we run the models with the maximum number of instruments based on 13 lags and report cases with significant changes.

The data set consists of 60 countries and 15 years (1990-2004). The cross-border M&A sales data is aggregated SDC Thomson Financial data that was initially compiled as individual transactions⁵. The annual aggregates of cross-border M&A sales represent gross capital inflows to the host countries and are denominated in current USD. All three dependent are in per capita annual growth rates. Manufacturing and services refer to ISIC⁶ divisions 15-37 and 50-99, respectively.

All data is from WDI and Economic Intelligence Unit reports except secondary school enrollments (UNESCO and WDI) and government stability (International Country Risk Guide). Sub-division of the panels by geographical regions and levels of development is based on the World Bank classifications.⁷ We categorize manufacturing-

⁵ All cross-border sales are included in the aggregate regardless of the percentage of acquired assets.

⁶ International Standard Industrial Classification (ISIC), revision 3.

⁷ The country list is as follows:

Full Sample: Argentina, Armenia, Australia, Austria, Bangladesh, Bolivia, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Cyprus, Czech Republic, Denmark, Ecuador, El Salvador, Estonia, Finland, France, Germany, Honduras, Hong Kong, China, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Rep., Malaysia, Mexico, Morocco, Myanmar, Netherlands, Norway, Pakistan, Paraguay, Peru, Philippines, Poland, Portugal, Russian Federation, Singapore, Spain, Sweden, Switzerland, Thailand, Tunisia, Turkey, Uganda, United Kingdom, United States, Venezuela, RB, Vietnam

Latin America & the Caribbean: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Honduras, Mexico, Paraguay, Peru, Venezuela, RB.

Western and Eastern Europe: Armenia, Austria, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Kazakhstan, Netherlands, Norway, Poland, Portugal, Russian Federation, Spain, Sweden, Switzerland, Turkey, United Kingdom.

based, services-based and mixed economies as follows. For each year an economy is defined “manufacturing-based” (services-based) if it has a share of manufacturing (services) larger than the sample average for that year **and** share of services (manufacturing) smaller than the average; it is defined “mixed” otherwise.

4. Results

We present in Tables 1 and 2 the results for the estimates of β_3 , the growth effects of M&A sales. The tables are divided into three panels corresponding to three ways of classifying the data: geographical regions (top panel), income groups (middle panel), and relative sector shares (bottom panel). Table 1 shows the results for total, primary sector and manufacturing cross-border M&A. It is divided into columns representing the effect of total M&A on aggregate growth and the effects of primary sector and manufacturing M&A on aggregate, manufacturing and services growths. Table 2 displays the estimates of β_3 for financial and nonfinancial M&A on growth in aggregate, manufacturing, and services sectors, respectively.

Total, primary sector and manufacturing cross-border M&A sales’ growth effects (Table 1)

As expected, we cannot find a robust relationship of M&A and aggregate growth (first column) and for most data classifications. There is weak evidence of a positive relation in high-income countries but a significant negative growth impact in middle-income economies. The only significant positive relation is obtained by a pooled OLS (POLS) estimation for the full sample and for mixed economies (not reported). These weak results compel us to look behind the aggregate numbers and into industry level analysis.

The next three columns show the sectoral effects of the primary sector M&A. Primary sector cross-border M&A sales produce a positive spillovers to the Latin American and Caribbean economies (LAC) and high income economies (HIC). While

South & East Asia and the Pacific: Australia, Bangladesh, China, Hong Kong, China, Hungary, Iceland, India, Indonesia, Japan, Korea, Rep., Malaysia, Myanmar, Pakistan, Philippines, Singapore, Thailand, Vietnam.

they enhance manufacturing growth in low income economies, they lead to deindustrialization in middle income economies. They also have positive spillovers to LAC, WEE and high income countries.

The last three columns show the sectoral estimates of the manufacturing M&A. The full sample results suggest that manufacturing M&A stimulate aggregate growth on average and this effect can be traced back to its significant impact in the manufacturing industry (first row). In terms of geographical distribution, results are positive but insignificant (top panel). Only the FE estimations suggest possible growth in both industries in the WEE area (not reported). An inspection of the income distribution reveals that despite an insignificant negative aggregate growth effect, manufacturing cross-border M&A clearly hurts growth in low-income economies (middle panel second column). This result is robust to model specification and suggests that cross-border M&A may indeed be detrimental to growth prospects in these economies. In middle- to high-income economies its growth enhancing effect in the same industry is insignificant.

In contrast, manufacturing M&A sales help aggregate growth in mixed economies and the effect operates via manufacturing (bottom panel). Yet, we encounter the negative spillovers once more in countries with a relatively large manufacturing basis, where manufacturing M&A reduces growth in services by draining resources from the industry.

Growth effects of financial and nonfinancial cross-border M&A sales (Table 2)

Evidence indicates significant aggregate growth effect of financial M&A sales in WEE, SEAP, middle-income countries, mixed economies, and of nonfinancial M&A sales in low-income countries (first and fourth columns). The growth effects of the financial M&A sales are mirrored in the manufacturing sector of the WEE region and middle-income economies, and in both manufacturing and the services sectors of the mixed economies. Manufacturing M&A also spills over positively to the services sector in high-income countries and stimulates growth.

However, tracing back the aggregate growth effects of nonfinancial service M&A sales remains elusive except in low-income economies where we can track down this effect in both manufacturing and services industries (middle right panel). The strong impact of nonfinancial sales has a likely dampening effect on the negative impact of

manufacturing M&A sales on manufacturing industry in these economies, reported in Table 1. Results also show that M&A sales fuel growth in services and spill over to manufacturing in SEAP, stimulating both industries (top right panel) despite an insignificant aggregate growth impact. We also note a strong negative impact of nonfinancial M&A sales in WEE region when estimations are conducted with FE and POLS.

5. Conclusion

This study looks at whether host countries benefit from cross-border M&A sales as a mode of entry of MNEs. We examine the data by breaking down the M&A sales into primary sector, manufacturing, financial services and nonfinancial services, and consider their impacts on aggregate growth, and growth in manufacturing and services, respectively.

Our findings are encouraging. In economies with relatively low shares of manufacturing, manufacturing cross-border M&A sales stimulate aggregate growth. Financial M&A sales enhance aggregate growth in Western and Eastern Europe (WEE), South East Asia and Pacific (SEAP) region, middle income economies and countries with a mixed industry basis, whereas nonfinancial cross-border M&A sales promote growth in low income countries. Primary sector cross-border M&A sales produce a positive spillover to the Latin American and Caribbean economies (LAC) and high income economies (HIC).

At the industry level, manufacturing M&A sales boost manufacturing activity on average, but hurts manufacturing in low-income countries and services activities in economies with a large share of manufacturing. However these negative outcomes are offset by the positive spillover of financial (nonfinancial) M&A in manufacturing industries in WEE, middle-income economies, and mixed economies (SEAP and low-income countries). Additional stimulus is provided to the services industry by financial M&A in high-income countries and mixed economies, and nonfinancial M&A in SEAP and low-income countries.

Thus, if M&A sales are allowed in services, most economies will benefit from them, irrespective of the geography and income distribution. The only caveat is that

manufacturing M&A sales are likely to lead to deindustrialization in the manufacturing industry in low-income economies. Likewise, primary sector M&A sales lead to deindustrialization in middle income economies.

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Table 1: Growth effects of total, primary sector and manufacturing cross-border M&A sales*

	Total M&A sales	Primary sector M&A sales			Manufacturing M&A sales		
	Aggregate growth	Aggregate growth	Manufacturing growth	Service growth	Aggregate growth	Manufacturing growth	Service growth
All countries	<i>n/a</i>	0.399 (0.49)	0.944 (0.25)	1.178 (0.02)	0.306 (0.03)	0.601 (0.09)	0.164 (0.25)
LAC	-0.112 (0.66)	0.378 (0.05)	0.08 (0.85)	0.453 (0.02)	0.467 (0.51)	0.341 (0.69)	<i>n/a</i>
WEE	0.101 (0.19)	0.564 (0.11)	<i>n/a</i>	0.864 (0.02)	0.053 (0.63)	0.305 (0.32)	0.054 (0.62)
SEAP	-0.058 (0.82)	0.694 (0.38)	0.968 (0.54)	-0.696 (0.50)	-0.261 (0.63)	-1.714 (0.19)	-1.918 (0.15)
Low income	0.056 (0.74)	0.229 (0.27)	0.569 (0.08)	0.094 (0.74)	-0.804 (0.10)	-2.550 (0.04)	-0.624 (0.31)
Middle income	-0.241 (0.03)	-0.317 (0.29)	-1.607 (0.00)	<i>n/a</i>	1.213 (0.20)	1.561 (0.47)	<i>n/a</i>
High income	0.311 (0.04)	0.301 (0.10)	-1.33 (0.13)	0.368 (0.03)	0.135 (0.18)	0.471 (0.21)	-0.041 (0.81)
Manufacturing based	-0.059 (0.66)	-2.365 (0.15)	<i>n/a</i>	-3.200 (0.11)	-0.021 (1.00)	1.973 (0.15)	-0.544 (0.01)
Mixed	-0.098 (0.38)	0.138 (0.46)	0.006 (0.99)	0.130 (0.58)	0.179 (0.01)	0.38 (0.08)	0.047 (0.57)
Services based	-0.101 (0.70)	0.105 (0.83)	-0.512 (0.49)	0.382 (0.45)	0.245 (0.03)	0.22 (0.51)	0.256 (0.35)

*The first entry in each cell is the estimate of the growth effect of cross-border M&A coefficient estimated by one-step System GMM method with external instruments. Figures in parentheses are p-values, and significant results are denoted in bold. The coefficients and p-values are robust to heteroscedasticity. The “n/a” results are due to second order autocorrelation in the error of the model. LAC, WEE, SEAP stand for Latin America and Caribbean, Western and Eastern Europe, South East Asian and Pacific, respectively.

Table 2: Growth effects of financial and nonfinancial cross-border M&A sales*

	Financial M&A sales			Nonfinancial M&A sales		
	Aggregate growth	Manufacturing growth	Services growth	Aggregate growth	Manufacturing growth	Services growth
All countries	0.067 (0.859)	1.262 (0.211)	0.384 (0.477)	-0.143 (0.420)	-0.164 (0.590)	0.139 (0.465)
LAC	0.313 (0.781)	0.529 (0.708)	0.687 (0.533)	0.118 (0.612)	0.406 (0.260)	-0.064 (0.763)
WEE	0.408 (0.063)	1.372 (0.014)	0.181 (0.251)	0.022 (0.861)	n/a	0.001 (0.984)
SEAP	0.778 (0.056)	0.383 (0.649)	n/a	0.053 (0.864)	1.333 (0.086)	2.273 (0.000)
Low income	-0.830 (0.575)	1.032 (0.414)	-0.721 (0.558)	0.388 (0.016)	0.488 (0.014)	0.334 (0.008)
Middle income	1.552 (0.019)	3.027 (0.100)	n/a	-0.063 (0.788)	0.373 (0.295)	n/a
High income	0.253 (0.290)	-0.319 (0.708)	0.408 (0.088)	-0.007 (0.978)	-0.558 (0.148)	0.357 (0.270)
Manufacturing based	-0.155 (0.850)	1.596 (0.340)	-0.329 (0.636)	-0.298 (0.109)	n/a	-0.046 (0.809)
Mixed	0.926 (0.004)	1.101 (0.044)	0.712 (0.029)	-0.356 (0.137)	-0.151 (0.713)	-0.102 (0.698)
Services based	0.105 (0.761)	0.127 (0.896)	-0.433 (0.452)	0.230 (0.408)	1.423 (0.140)	0.912 (0.141)

*See footnote to Table