DOES INCREASED MERGER ACTIVITY CAUSE INVESTMENT?

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ABSTRACT

The considerable expansion in mergers and acquisitions across the globe has focused attention on whether this phenomena enhances overall economic outcomes. This study attempts to investigate the empirical relationship between mergers and acquisitions and investment. The essay uses data on over 60 developed and developing countries over the period 1987 to 2001 and finds that mergers and acquisitions do seem to 'Granger cause' investment. This result is robust to changes in the model and estimation procedure.

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1. Introduction

Since the early-1990s, there has been a significant expansion in number of mergers and acquisitions across the globe. Statistics on corporate consolidations collected by the United Nations' Conference on Trade and Development (UNCTAD) suggests that, on average, over five thousand deals were done per year across the world between 1994 and 2004 (a cumulative 58,000 deals during the period), or more than twice the annual number completed between 1987 and 1993. Although most of these deals were in developed economies (about 75 percent on average), the share of transactions done in developing countries has risen from just 6 percent in 1987 to almost 27 percent in 2004.

There exists a large body of literature examining why firms merge and the effects of these consolidations on firm performance (see Andrade, Mitchell and Stafford, 2001, for a review of this literature). This literature, in agreement with neoclassical economic theory, finds that mergers tend to improve the operating performance of the new entity relative to industry peers, thereby leading to shareholder gains for both the acquiring and acquired firm. The improved operating performance and larger asset base may therefore provide the firm greater access to capital as well as reduce the cost of financing projects (see for example, Ayyagari, Demirguc-Kunt and Maksimovic, 2006; Inderst and Mueller, 2001). The increased size of the firm may also provide the necessary capital base required to invest in research and development activities.

This essay investigates the 'Granger (1969) causal' relationship between increased merger and acquisition activity and investment. To the authors' knowledge this is the first study to explicitly explore this causal relationship. The paper uses data on over 60 developed and developing countries between 1987 and 2002. A description of the panel Granger causality tests employed along with a description of the data are presented in the subsequent section.

2. Methodology and Data

A variable x is said to 'Granger (1969) cause' y if one is able to better predict y using lagged values of x. Traditional panel data causality analysis is conducted using the approach put forward by Holt-Eakin, Newey and Rosen (1988):

$$y_{it} = \alpha_i + \sum_{k=1}^{p} \gamma_k y_{it-k} + \sum_{k=0}^{p} \beta_{ik} x_{it-k} + \varepsilon_{it} \quad (1)$$

where each individual is denoted by $i = 1, 2, \ldots, N$, time period $t = 1, 2, \ldots, T$, α are the country-specific slope coefficients, γ and β are the regression coefficients on lagged values of y and contemporaneous as well as lagged values of x and ε is an error term assumed to be independently and identically distributed with a zero mean and variance σ_ε^2.

To eliminate the individual country-effects, one can difference the data, resulting in the model of the following form:

$$y_{it} - y_{it-1} = \sum_{k=1}^{p} \gamma_k (y_{it-k} - y_{it-k-1}) + \sum_{k=0}^{p} \beta_{ik} (x_{it-k} - x_{it-k-1}) + (\varepsilon_{it} - \varepsilon_{it-1}) \quad (2)$$

One can therefore test the hypothesis that x Granger causes y with an F-test of the joint hypothesis:

$$\beta_1 = \beta_2 = \ldots = \beta_k = 0$$

This specification suffers from the problem of simultaneity as the error term $(\varepsilon_{it} - \varepsilon_{it-1})$ is correlated with the regressor $(y_{it} - y_{it-1})$. As a result, the authors employ the Generalised Method of Moments (GMM) estimation procedures suggested by Arellano and Bond (1991), first differences of the variables are employed as instruments, and the Arellano and Bover (1995) and Blundell and Bond (1998), first difference terms as well levels of the variables are used as instruments, to deal with the correlation. Time dummies are also included in all regressions.

The data on the number of mergers and acquisitions ($LNMA$) is taken from the UNCTAD's database available at www.unctad.org. This database provides information for each of the 60 countries (see Appendix) studied for the period 1970 to 2004. To proxy real investment (LRI) the authors deflate nominal gross capital formation by the GDP deflator, both were taken from

the World Bank's World Development Indicators CD-Rom (2005). All variables are expressed in natural logarithms.

3. Empirical Evidence

Table 1 presents the panel granger causality tests based on various panel estimators. The first column estimates a simple pooled model of investment which includes lags of the dependent variable as well as contemporaneous and lagged values of the number of mergers and acquisitions. The optimal lag length, chosen by an F-test, is set at 2. There are a number of factors to note about the results. First, the number of mergers and acquisitions has a positive and significant impact on real investment. Second, the lagged values of the dependent variable as well as the contemporaneous and lagged values of the number of mergers and acquisitions account for most of the variation in investment during the sample period. And third, a (chi-square) exclusion restriction test suggests that coefficients on the lagged and contemporaneous values of the number of mergers and acquisitions can not be restricted to zero: the hypothesis that mergers and acquisitions 'Granger causes' investment can therefore not be rejected at classical levels of testing.

This model, however, does not allow the intercept of the regression to vary across countries. As a result, a least squares dummy variable model is estimated in levels and differences. The results were unchanged, with the coefficients on the merger and acquisition variable being significantly different from zero. While these estimators take into account cross-country heterogeneity, they ignore the fact that as a result of presence of a lagged dependent variable in the model, the error term will now be correlated with the dependent variable, which violates one of the main assumptions of the least squares model. To account for this correlation, panel GMM techniques are employed. However, the main finding of the study so far, that mergers and acquisitions 'Granger cause' investment remains intact.

To check for the robustness of results to model misspecification, the Granger causality test equations are augmented with other macroeconomic variables that could influence the evolution

of investment. These are the real interest rate, i, inflation, π, (as a measure of uncertainty) and the availability of finance, dc, (proxied by domestic credit provided by the banking sector as a percentage of GDP). Nevertheless, as Table 2 shows the main findings of the study do not change.

4. Conclusions

Using data on over 60 developed and developing countries from around the world between 1987 and 2001, this study attempts to investigate the 'Granger causal' relationship between investment and mergers and acquisition. Panel Granger causality techniques are employed and the results suggest that mergers and acquisitions do 'Granger cause' investment. This result is robust to variation in the panel estimator used as well as the addition of other factors that might impact on investment. These findings suggest that besides the gains accruing to shareholder from mergers and acquisitions, it could also have positive consequences for the overall macroeconomy through stimulating investment.

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Appendix – List of Countries

Argentina, Australia, Austria, Barbados, Belgium, Brazil, Canada, Chile, China, Colombia, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, China, Hungary, Iceland, India, Indonesia, Ireland, Italy, Japan, Korea, Rep., Lebanon, Luxembourg, Malaysia, Mauritius, Mexico, Morocco, Namibia, Namibia, Netherlands, New Zealand, Nicaragua, Norway, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Saudi Arabia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Thailand, Tunisia, Turkey, Ukraine, United Kingdom, United States, Venezuela, Zimbabwe

Table 1: Investment and Mergers and Acquisitions

Dependent Variable: LRI_t	Pooled	LSDV - Levels	LSDV -Differences	GMM Differences – Difference Instruments	GMM Levels – Levels and Difference Instruments
LRI_{t-1}	1.506 (0.057)**	1.129 (0.088)**	0.475 (0.120)**	1.026 (0.122)**	1.422 (0.093)**
LRI_{t-2}	-0.555 (0.043)**	-0.302 (0.069)**	-0.040 (0.064)	-0.230 (0.092)**	-0.499 (0.066)**
LMA_t	0.068 (0.028)**	0.065 (0.019)**	0.062 (0.017)**	0.095 (0.032)**	0.160 (0.048)**
LMA_{t-1}	-0.042 (0.028)	-0.056 (0.028)*	-0.016 (0.038)	-0.083 (0.037)**	-0.090 (0.040)**
LMA_{t-2}	0.031 (0.030)	-0.023 (0.026)	-0.031 (0.020)	-0.050 (0.033)	0.009 (0.030)
Constant	0.749 (0.391)*	3.354 (0.593)**	0.004 (0.052)	-0.041 (0.060)	1.238 (0.567)**
Number of Observations	565	565	505	505	565
Adjusted R^2	0.989	0.992	0.532	0.382	0.988
Chi-square Exclusion Restriction Test of $\sum_{k=0}^{K} LMA_{t-k}$ [significance level]	18.111 [0.000]	17.644 [0.001]	20.904 [0.000]	14.831 [0.002]	15.618 [0.001]

Note: * and ** indicates significance at the 5 and 10 percent level of testing, respectively.

Table 2: Investment and Mergers and Acquisitions (Allowing for the Effects of Interest Rates, Inflation and the Availability of Finance)

Dependent Variable: LRI_t	Pooled	LSDV - Levels	LSDV -Differences	GMM Levels – Levels and Difference Instruments
LRI_{t-1}	0.928	0.838	0.160	0.918
	(0.052)**	(0.064)**	(0.127)	(0.053)**
LRI_{t-2}	0.065	0.043	-0.128	0.072
	(0.050)**	(0.047)	(0.088)	(0.049)
LMA_t	0.053	0.061	0.057	0.061
	(0.012)**	(0.013)**	(0.014)**	(0.017)**
LMA_{t-1}	-0.014	-0.017	0.031	-0.016
	(0.013)	(0.013)	(0.015)**	(0.016)
LMA_{t-2}	-0.040	-0.048	-0.001	-0.042
	(0.012)**	(0.014)**	(0.014)	(0.012)**
i	-0.002	-0.001	0.000	-0.001
	(0.001)**	(0.001)	(0.000)	(0.001)*
dc	-0.000	-0.001	0.001	-0.000
	(0.000)	(0.001)	(0.001)	(0.000)**
π	-1.477	-1.338	-0.914	-1.517
	(0.119)**	(0.319)**	(0.365)**	(0.123)**
Constant	0.205	2.350	-0.122	0.265
	(0.070)**	(0.714)**	(0.023)**	(0.092)**
Number of Observations	504	504	448	504
Adjusted R^2	0.996	0.996	0.296	0.996
Chi-square Exclusion Restriction Test of $\sum_{k=0}^{K} LMA_{t-k}$ [significance level]	36.796 [0.000]	29.042 [0.000]	18.676 [0.000]	19.986 [0.000]

Note: * and ** indicates significance at the 5 and 10 percent level of testing, respectively.