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MARKET MOBILISED CAPITAL, LEGAL RULES AND ENFORCEMENT

BY

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Market Mobilised Capital, Legal Rules and Enforcement

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I. Introduction

In recent years there have been a number of strands in economic literature that have related aspects of the institutional environment to financial and economic development, both directly and indirectly. This has been made possible by the development by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997, 1998) of measures of creditor protection laws, investor protection laws and the quality of law enforcement which they use to investigate a variety of issues. A major theme of their work is the consistent influence of legal families (common law, French civil code, German civil code, Scandinavian) on aspects of the financial and corporate systems of countries. The investor and creditor protection variables developed in this work allow the influence of differences in such laws on various aspects of the financial and corporate sectors to be analysed.

A number of authors have used these measures of legal institutions in work which relates growth or development to the existence of a healthy financial sector which is in turn a function of legal institutions. This has become known as the 'Law and Finance' literature. King and Levine (1993), Levine (1999), Levine and Zervos (1998) and Levine (2003) demonstrate the relationship between growth and various measures of the financial sector. Levine (1999) extends this to show that the measures of financial sector development are themselves functions of creditor protection laws, the risk of government contract modification and accounting regulations. The latter are however seen primarily as instrumental variables to overcome the endogeneity of the financial sector variables. Levine (2003) extends this to an analysis of stock-market development and shareholders' rights. Azfar, Matheson and Olson (1999) as part of a programme on 'market augmenting government' developed the concept of 'Market-Mobilised Capital' (MMC) which they claim plays a central role in economic growth. MMC is the sum of stocks of debt and equity as a proportion of GDP. Azfar and Matheson (2003) in a development of this work deal with issues of endogeneity and causality by the use of measures of investor protection, creditor protection and enforcement of laws as instruments on market mobilised capital.

The present paper seeks to extend the work reported in Azfar and Matheson (2003) on the significance of market mobilised capital for growth by examining more closely the role played by investor and creditor protection laws and their enforcement on the components of market mobilised capital and thus growth.

II. Laws and their Enforcement

The literature referred to above has sought to explain the relationship between an economy's growth and its institutional structure. Institutional structure has been proxied in this literature by various indices of laws protecting the property rights of creditors and investors and the degree to which laws are enforced in each country. The focus has been the relationship between growth and the development of the financial sector of the economy. It is the development of the financial sector which is seen to be a function of the institutional structure. A legal system which protects creditors and investors and within which the rule of law is enforced, it is argued, fosters a healthy financial sector which provides the resources for economic growth. Since much of the empirical work discussed above is essentially concerned with

identifying instruments to overcome the endogenous nature of a key variable in determining economic growth it treats the legal and enforcement variables in a fairly *ad hoc* manner. For example, Azfar and Matheson (2003) treat their regressions on the determinants of bank lending and market capitalisation largely as a means of screening for relevant instruments for the variable 'market-mobilized capital' in their growth equation. Nevertheless, this does not stop authors from reaching fairly strong policy conclusions about the role of improvements in investor and creditor protection laws on economic growth:

In this paper we showed that a country's collateral and corporate laws...have significant effects on economic growth...Our findings improve on earlier work by showing that statutory commercial law and financial market development have a direct effect on economic growth even after controlling for law enforcement....This is a finding of some policy relevance. Much second-generation reform has concentrated on the reform of commercial laws, and our findings suggest that this can have a large economic payoff. (Azfar and Matheson, 2003, pp369,370)

In the present paper more attention is paid to the relationship between legal rules and their enforcement. It is important to do this in order to see whether there is any leverage for policymakers in using legal instruments to improve economic growth. If, for example, certain legal rules were found to be important for developing the financial sector, policy makers might be interested in adopting them to facilitate the growth of that sector and, in the long run, the economy as a whole. However, if these rules are only effective in a legal system with very high levels of enforcement their introduction to a country where enforcement is low would be ineffective. None of the studies cited above allow for such interaction between enforcement and specific laws. They have been considered by others concerned with the need of effectively enforcing other types of rules. However, these papers deal with different issues, such as the rate of bankruptcies (Claessens *et al.* (1999)), currency depreciation and change in the stock market in emerging markets after the Asian crisis (Johnson *et al.* (2000)) and the number of mergers and acquisitions (Rossi and Volpin (2001)). With the only exception being the changes in the stock market value, the interaction between commercial rules and enforcement tends to be positive and significant in explaining the behaviour of these variables.

The significance of the interaction of enforcement with specific legal rules governing investor and creditor protection is tested below. In order to bring out clearly the difference which this approach makes, the data used is the same as that used by Azfar and Matheson (2003).

Azfar and Matheson (2003) develop the concept of Market Mobilised Capital (*MMC*) as a measure of financial market development. *MMC* is the sum of the stock of credit by commercial and deposit-taking banks to the private sector divided by GDP (*BYP*) and the average value of listed domestic shares on domestic exchanges divided by GDP (*MCAP*). They show that the size of *MMC* is determined by, *inter alia*, creditor and investor protection laws and an index of the extent to which contracts are protected and the rule of law is effective. Essentially these institutional variables are used as instrumental variables in regressions in which growth is shown to be determined by, among other things, *MMC*.

The variables used by Azfar and Matheson (2003) include the financial sector variables used in Levine and Zervos (1998) and legal rule variables used in La Porta

et al. (1998). These legal rules have been identified previously as protecting shareholders' rights on the one hand and creditors' rights on the other. In the case of shareholders' rights they protect minority shareholders against the expropriation of their investment by managers or majority shareholders. Without the protection of such laws investment in the stock market will be discouraged and this potential vehicle for supporting economic growth inhibited. In the case of creditor protection they protect creditors' (particularly banks') interest in the assets of defaulting debtors.

The legal rules taken to protect shareholders are:

1. Those guaranteeing one share one vote to shareholders.
2. Those allowing shareholders to vote by proxy.
3. Those protecting the interests of minority shareholders.
4. Those requiring a mandatory dividend to be paid to shareholders.

It is argued by Azfar and Matheson (2003) that the first three of these rules enhance stock market capitalisation but the mandatory dividend rule reduces expansion of firms through retained earnings and therefore will reduce stock market capitalisation. A variable *CORPL* is created by aggregating these variables. Its value rises by one for each of the first three which are present. Where a dividend is mandatory the value of *CORPL* is reduced by $0.N$ where N is the percentage of mandatory dividend.

The legal rules seen as affecting creditors are:

1. Protection of secured lenders who are paid first in the distribution of proceeds from the sale of a bankrupt firm.
2. Laws prohibiting the sale of assets when an application is filed for reorganisation of a bankrupt firm. Such a rule is seen in the literature as antithetic to the interests of secured lenders and thus a negative influence on lending.
3. Laws which allow firms in administration pending reorganisation to remain under the control of existing management. Again such a rule is seen to be against the interests of secured creditors.

Azfar and Matheson (2003), following others in the literature, argue that the presence of the first type of creditor protection law enhances bank lending while the presence of the other two detracts from bank lending. Thus a variable *COLLAW* is created which rises by one in the presence of the protection of secured lenders but which falls by one for the presence of each of the other two. Thus its value can range from -2 to +1.

A number of the papers referred to above have stressed the importance of the rule of law for the development of financial and other markets. Azfar and Matheson (2003), along with other authors, argue that the enforcement of property rights and protection against state repudiation of contracts is important from the point of view of market development. They use the average of the 'Rule of law' index and the risk of contract repudiation index defined by La Porta *et al.* (1998). It takes values from zero to ten. In the regressions in the present paper this is the variable *ENFORCE*.

Azfar and Matheson (2003) run a number of regressions to find variables which may be used as instruments for *MMC*. They run preliminary regressions on the determinants of *BPY* and *MCAP* which are found to be *ENFORCE* and respectively *CORPL* and *COLLAW*. However, in their final growth regressions they use all the

components of *COLLAW* and *CORPL* together with a set of control variables and *ENFORCE* as instruments for MMC. Below we repeat some of these regressions using the same data but allowing for the interaction of *ENFORCE* and the investor and creditor protection variables. We find that the regressions reported by Azfar and Matheson (2003) imply the imposition of invalid restrictions on one of these more general equations. Furthermore, the imposition of valid restrictions suggests importantly different policy prescriptions for some countries than those suggested by Azfar and Matheson (2003).

Table 1 presents the results on the determinants of Market Capitalisation (*MCAP*). Column (1) shows the result of regressing *MCAP* on *ENFORCE* and *CORPL* as done by Azfar and Matheson (2003). Column (2) shows the results of a more general specification which includes as additional explanatory variables:

ENF2, the square of *ENFORCE*

ENFCORP, the product of *ENFORCE* and *CORPL*

ENSQCOR, the product of *ENF2* and *CORPL*

and control variables used by Azfar and Matheson (2003) in later regressions:

TRDY, a measure of the country's integration in international trade

LSEC, logarithm of mean years of secondary school education for the country

LRGDP, logarithm of GDP of the country in 1976

REVCROUP, number of revolutions and coups in the country during the period

This general specification permits the testing of alternative functional forms.

The validity of the exclusion restrictions on (2) implied by regression (1) are tested by means of an F test and Likelihood Ratio test on the joint restrictions, the values of which are shown at the foot of column (1). In both cases the restrictions are rejected.

An alternative set of exclusion restrictions are imposed in the regression reported in column (3) and their joint validity tested by an F test and Likelihood Ratio test. This set of restrictions can be validly imposed. This regression result suggests that not only does a country's degree of integration in international trade influence the size of its stock market capitalisation but also that the latter is determined by the interaction of *ENFORCE* and *CORPL*. Thus the influence which investor protection laws have on stock market capitalisation depends on the extent to which a country's laws are enforced. This is, perhaps, an unsurprising result which, nevertheless, has significant implications for policies to promote the growth of stock markets and which has not been identified previously.

The estimated coefficients suggest also that at low levels of enforcement the introduction of investor protection laws may even be counterproductive. The estimated coefficients in column (3) of Table 1 imply that at levels of *ENFORCE* below 4.46 'improving' investor protection laws will result in a reduction in stock market capitalisation. Four countries in the data set fall in this range (Nigeria, Pakistan, Philippines, Zimbabwe) and one is just marginally above it (Colombia). Furthermore, the impact of *ENFORCE* reaches its maximum when it is 8.36. Most developed countries in the sample together with Hong Kong, Singapore and Taiwan are above this level. The exceptions among developed countries are Spain and Greece.

Table 1: Determinants of MCAP

Number of obs	39	39	39
F	18.81 _(2,36)	18.75 _(9,29)	45.49 _(4,34)
Prob > F	0.0000	0.0000	0.0000
R-squared	0.5110	0.8533	0.8426
Adj R-squared	0.4838	0.8078	0.8240
Root MSE	.21648	.13209	.12639
Variable	Coef. Std. Err	Coef. Std. Err	Coef. Std. Err
Trdy		.2760601***	.2990475***
lrgdp		.0504945	.0451281
lsec		-.0149016	
revcoup		.0435472	
enforce	.040921*	-.0202511	
enf2	.0169574	.085259	
corpl	.2120403***	-.0199917	
enfcorp	.0403538	.1343718	
ensqcorp		-.2598925	
_cons	-.2213587	.2336138	
	.1329005	.0189883	
		.0158462	
		-1.375144*	-.7261641**
		.560926	.2641649
		.4205908*	.2220352**
		.1700472	.0800571
		-.0271325*	-.0132856*
		.0119067	.0056691
		.996711	-.0133091
		.7801644	.0347228
Tests of Restrictions			
F test	9.67 _(7,29)		0.43 _(5,29)
Probability	0.0000		0.8269
LR test chi2_(x)	46.96 ₍₇₎		2.76 ₍₅₎
Probability	0.0000		0.7365

Notes: * significant at 5% level on a two tailed test
 ** significant at 1% level on a two tailed test
 *** significant at 0.1% level on a two tailed test

These results suggest that the countries in this sample fall into four groups as far as policies to promote stock market capitalisation are concerned:

1. Those for which the priority should be improvement in the enforcement of the 'Rule of Law' (Nigeria, Pakistan, Philippines, Zimbabwe and possibly Colombia);
2. Those for which only improvements in investor protection laws can increase stock market capitalisation (Portugal, Singapore, Italy, Taiwan, France, United Kingdom, Japan, Australia, Canada, Germany, USA, Finland, New Zealand, Denmark, Netherlands, Belgium, Sweden, Austria and Norway);
3. Hong Kong for which *CORPL* is at its maximum and where *ENFORCE* is greater than 8.36;
4. Those for which improvements in both enforcement and investor protection would lead to greater stock market capitalisation (Indonesia, Egypt, Argentina, India, Turkey, Mexico, Israel, Brazil, Greece, Chile, Thailand, Korea, Malaysia and Spain).

Table 2 presents the results for regressions on the determinants of bank lending (*BPY*). Column (1) shows Azfar and Matheson's results, while column (2) shows the results for a more general set of regressors as in Table 1. However here *COLLAW* and its interaction with *ENFORCE* (*ENFCOLL*) and *ENF2* (*ENSQCOLL*) are substituted for *CORPL*, *ENFCORP* and *ENSQCORP*. In this case both the F test and the Likelihood Ratio test suggest that the restrictions imposed by Azfar and Matheson (2003) are valid. Thus improvements in either enforcement or creditor protection are seen to result in an increase in bank lending.

Table 2: Determinants of BPY

Number of obs	39	39
F	20.40 _(2,36)	5.31 _(9,29)
Prob > F	0.0000	0.0003
R-squared	0.5313	0.6225
Adj R-squared	0.5053	0.5053
Root MSE	0.31902	0.319
Variable	Coef.	Coef.
	Std. Err	Std. Err
trdy		.2017589
		.12309
lrgdp		-.0349005
		.1105645
lsec		.1966786
		.2387147
revcoup		.567784
		.3949553
enforce	.1574683***	.4686862
	.0250066	.3522545
enf2		-.0222267
		.0232423
collaw	.095693	.7033928
	.0488992	1.028371
enfcoll		-.1532877
		.3060701
ensqcoll		.0084918
		.0213261
cons	-.3396885	-2.024821
	.1937461	1.184976
Tests of Restrictions		
F test		1.00 _(7,29)
Probability		0.4508
LR test chi2_(x)		8.44 ₍₇₎
Probability		0.2955

What are the implications for growth of these results? Following Azfar and Matheson (2003) this is done by running an Instrumental Variables regression of the determinants of average growth per capita for the period 1976-93 (*GRYP*). However, here we treat this equation explicitly as part of a system of three equations being estimated equation by equation. The other equations of the system are equation (3) in Table 1 and equation (2) in table 3 showing the determinants of *MCAP* and *BPY* respectively. Furthermore, initially these two variables are included in the IV estimation rather than *MMC*. The explanatory variables used in the growth regression

are the control variables used in the earlier unrestricted regressions together with *MCAP* and *BPY* which are clearly endogenous. The instruments used for the endogenous variables are those in the final OLS regressions for the two variables together with the exogenous (control) variables.

Table 3: IV Estimates of Determinants of GRYP

Number of obs	39	39
F	6.68 _(6,32)	12.83 _(4,34)
Prob > F	0.0001	0.0000
R-squared	0.4502	0.5542
Adj R-squared	0.3471	0.5017
Root MSE	1.7065	1.4908
variables	Coef. Std. Err.	Coeff. Std. Err.
bpy	4.270851* 1.824703	
mcap	1.52286 1.941244	
mmc		2.707213*** .553866
trdy	-.0260805 1.005617	
lrgdp	-2.06361*** .4273683	-1.956633*** .3578195
lsec	1.811794 .9724138	2.127694** .7770075
revcoup	-2.824543* 1.171309	-2.913149** 1.013731
cons	8.47784** 2.553819	7.294475*** 1.759189
Test of Restrictions:		
F		0.45 _(2,32)
Prob > F		0.6394

Endogenous: bpy mcap mmc.
 Instruments: enforce collaw corpl enfcorp
 ensqcorp trdy + trdy lrgdp lsec
 revcoup.

The results of this unrestricted IV regression are presented in column (1) of Table 3. Two restrictions are jointly tested. The first is that the coefficients on *MCAP* and *BPY* can be constrained to be equal. This is actually a test of whether *MMC* should replace these two variables. The second restriction is that *TRDY* can be excluded from the growth equation. Both the F and LR tests suggest that these restrictions are jointly valid. The result of imposing these restrictions is shown in column (3) of the table. It should be noted that the first of the two restrictions implies that changes in *MCAP* and *BPY* have the same effect on growth. Thus the source of the growth of the financial sector does not appear to affect the rate of economic growth. Neither the validity of the restrictions nor the significance levels of any of the variables are affected by using a robust IV estimator, as was done by Azfar and Matheson (2003).

III Conclusions

This paper is presented as a contribution to the Law and Finance literature. That literature sees the financial sector as an source of growth and legal institutions as a significant determinant of financial sector development. We extend the contribution to this literature of Azfar and Matheson (2003). These authors demonstrate that their measure of Market-Mobilised Capital (*MMC*) is a significant determinant of growth and is in turn influenced by legal institutions. However, they (in common with much research in this field) do not consider the nature of the relationship between legal institutions and their measure of financial sector development (*MMC*). They do not consider the underlying structural relationship between legal institutions and financial sector development. It is the argument of this paper that the nature of this structural relationship has major implications for policy-makers.

To demonstrate this we utilise the same, widely used, data set as Azfar and Matheson (2003). We use a more general specification of the relationship between legal institutions and the extent of financial development and estimate it in the context of a system of equations which is estimated equation by equation. This approach highlights the relevance of the specification of the relationships for policy-making. It also puts it in a context where it has already been shown that legal institutions have a significant impact on economic growth.

The results differ from those implied by Azfar and Matheson (2003) in that the size of the capital market component of *MMC* is found to be strongly influenced by the **interaction** of investor protection laws with the quality of legal enforcement. This is an important result from the perspective of policy-making. The implication of it is that for countries with low levels of enforcement focusing on improving investor protection laws does not necessarily contribute to increasing the size of the stock market (and hence growth). For such countries the main priority should be improved enforcement within the legal system and creditor protection. Given the high correlation between the quality of law enforcement and the level of development, these are likely to be developing countries. This cautions against concentrating on reform of commercial laws rather than developing the effectiveness of the legal system. Our results also suggest that at high levels of enforcement there is little to be gained (in this context) from further improvements in the level of enforcement. On the other hand, we confirm the other general qualitative results of Azfar and Matheson (2003) that: (1) the size of *MMC* positively affects growth; (2) this result is invariant to the relative contributions of the two components of *MMC* (i.e. the Modigliani and Miller capital structure irrelevance hypothesis holds in this context).

References

- Azfar, O., Matheson, T. and Olson, M (1999) "Market-Mobilized Capital", *IRIS Center Working Paper 233*, University of Maryland, College Park.
- Azfar, O., and Matheson, T. (2003) "Market-Mobilized Capital", *Public Choice*, 117, pp. 357-372.
- Claessens, S., S. Djankov and L. Klapper (1999) "Resolution of Corporate Distress: Evidence from East Asia's Financial Crisis" *World Bank WP*
- Furubotn, E and Richter, R. (2000) *Institutions and Economic Theory*, Ann Arbor: University of Michigan Press.
- Gilson, S. (1989) "Management turnover and financial distress" *Journal of Financial Economics* 25, 241-62.
- Johnson S., P. Boone, A. Breach and E. Friedman (2000) "Corporate governance in the Asian financial crisis" *Journal of Financial Economics*, 58, pp. 141-186
- King, R. G. and Levine, R. (1993) "Finance entrepreneurship and growth: Theory and evidence", *Journal of Monetary Economics*, Vol. 32, 513-42.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. W. (1997) "Legal Determinants of External Finance", *Journal of Finance*, Vol. 52, 1131 - 50.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. W. (1998) "Law and Finance", *Journal of Political Economy*, Vol. 106, 1113 - 54.
- Levine, R. (1999) "Law, Finance and Economic Growth", *Journal of Financial Intermediation*, Vol 8, 89 - 35.
- Levine, R. (2003) "Napoleon, Bourses, and Growth, with a Focus on Latin America" in O. Azfar and C. A. Cadwell (eds) *Market-Augmenting Government: The Institutional Foundations of Prosperity*, Ann Arbor: University of Michigan Press.
- Levine, R., and Zervos S. (1998) "Stock markets, banks and economic growth", *American Economic Review*, Vol. 88, 537 - 58.
- Rossi, S and P. Volpin (2001) "Cross-Country Determinants of Mergers and Acquisitions" *London Business School WP*

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