CORPORATE GOVERNANCE AND EQUITY VALUE MULTIPLE: EVIDENCE FROM NIGERIAN LISTED FIRMS

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ABSTRACT

The failure of corporate entities has continued to draw the attention of various stakeholders across the globe. As a result of this problem, different countries have issued Corporate Governance (CG) guidelines. Part of the objective of these guidelines is to improve firm values. In Nigeria, similar guidelines (known as the Codes of Corporate Governance) were issued for corporate organizations to align the country with the global best practice. However, researchers, investment analysts, and other stakeholders continue to argue whether those governance mechanisms increase the value of stockholders. Others recommend that firm governance practices should be considered before making investment decisions while others argue that governance practices are not important in Nigeria. In order to address the problem, this research empirically examined the effects of eight corporate governance variables on the equity value multiple (EVM) of Nigerian firms. The study used data of 100 firms listed on the Nigerian Stock Exchange (NSE) for the period of 2009-2013. The study used the Generalized Method of Moment (GMM) to estimate the regression due to the endogeneity problem among the variables. The study applied the Principal Component Analysis (PCA) method to generate equity value multiple from the four equity valuation multiples. The results reveal a significant positive relationship between board size, board independence, board gender diversity, audit committee independence, managerial shareholding, and disclosure of corporate governance information at 1% level of significance. This study contributes to the understanding of the governance-equity value relationship by examining some corporate governance variables. The results further provide an insight for practitioners and policy makers on the importance of corporate governance codes consideration towards investment decision in Nigeria. Therefore, the study recommends consideration of the above CG variables in making investment decision.

Keywords: corporate governance, equity value multiple, principal component analysis, Nigerian Stock Exchange

ABSTRAK

Kegagalan entiti korporat terus menarik perhatian pelbagai pihak berkepentingan di seluruh dunia. Akibat daripada masalah ini, banyak negara telah mengeluarkan garis panduan Tadbir Urus Korporat (CG). Sebahagian daripada objektif garis panduan ini adalah untuk meningkatkan nilai firma. Di Nigeria, garis panduan yang sama, yang dikenali sebagai kod CG, telah diisukan untuk organisasi korporat bagi memastikan amalan negara selari dengan amalan terbaik global. Namun, para penyelidik, penganalisa pelaburan, dan pihak berkepentingan yang lain terus mempertikai sama ada mekanisme tadbir urus meningkatkan nilai pemegang saham. Di satu pihak, terdapat syor bahawa amalan tadbir urus firma perlu dipertimbangkan sebelum membuat keputusan pelaburan, sementara pihak lain mengatakan bahawa amalan tadbir urus tidak penting di Nigeria. Bagi menangani masalah ini, kajian ini secara empirikal mengkaji kesan lapan pemboleh ubah tadbir urus korporat ke atas nilai ekuiti pelbagai (EVM) firma Nigeria. Kajian ini menggunakan data daripada 100 syarikat yang disenaraikan di Bursa Saham Nigeria (NSE) bagi tempoh 2009-2013. Kajian ini menggunakan *Generalized Method of Moment* (GMM) untuk menganggarkan regresi kerana masalah endogeniti antara pemboleh ubah. Kajian ini juga menggunakan kaedah Analisis Komponen Utama (PCA) untuk menjana EVM firma daripada empat pengganda penilaian ekuiti. Keputusan kajian mendedahkan hubungan positif yang signifikan antara saiz lembaga, kebebasan lembaga, kepelbagaian jantina lembaga, kebebasan jawatankuasa audit, pegangan saham pengurusan, dan pendedahan maklumat tadbir urus korporat pada aras keertian 1%. Kajian ini menyumbang kepada pemahaman tentang hubungan tadbir-ekuiti dengan memeriksa beberapa pembolehubah tadbir urus korporat. Seterusnya, keputusan kajian ini memberi maklum balas untuk pengamal dan pembuat dasar tentang kepentingan tadbir urus korporat terhadap keputusan pelaburan di Nigeria. Oleh itu, kajian ini mencadangkan bahawa pembolehubah CG dipertimbangkan dalam membuat keputusan pelaburan

Kata kunci: tadbir urus korporat, nilai ekuiti pelbagai, analisis komponen utama, Bursa Saham Nigeria.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

AC	Audit Committee
ACI	Audit Committee Independence
ADC	Abnormal Directors Compensation
BS	Board Size
BGD	Board Gender Diversity
BI	Board Independence
CBN	Central Bank of Nigeria
CG	Corporate Governance
CGC	Corporate Governance Code
CGD	Corporate Governance Disclosure
CEO	Chief Executive Officer
CEOP	Chief Executive Officer Power
CGI	Corporate Governance Index
DS	Directors Shareholding
EVM	Equity Value Multiple
GMM	Generalize Method of Moments
ID	Independent Director
IASB	International Accounting Standard Board
NAICOM	National Insurance Commission
NSE	Nigerian Stock Exchange
NLF	Nigerian Listed Firms
NED	Non-executive Directors

MS	Managerial shareholding
NTWG	National Technical Working Group
NYSE	New York Stock Exchange
USA	United States of America
P/E	Price to Earnings Multiple
P/B	Price to Book Value Multiple
P/C	Price to Cash Flow Multiple
P/S	Price to Sales Multiple
PCA	Principal Components Analysis
PM	Profit Margin
ROA	Return on Assets
ROE	Return on Equity
SEC	Securities and Exchange Commission
2SLS	Two Stage Least Square
TQ	Tobin‘s Q

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Equity and debt are the two sources of business financing across the globe. Equity refers to the excess residual interest of an enterprise asset after liabilities are deducted (Pope & Puxty, 1991). Equity financing through the issuance of shares to investors appears to be the most preferred source when either starting or expanding a business. This is explained by the fact that companies can easily raise the required amount of capital and avoid costs such as high interest rates of business financing through debt. Srinivasan and Phansalkar (2003) documented that financing company through equity is more attractive and preferred compared to financing through debts, because the claim of providers of equity is only on the residual value.

The most common methods of valuing equity are the valuation multiples (Milicevic, 2009). Valuation multiples simply refer to the expression of firm equity market values in relationship to important indicators such as the price-to-book value that are assumed to have a relationship with those values (Suozzo, Copper, Sutherland, & Deng, 2001). Valuation multiples are widely used in research reports and stock recommendations for both the buying and selling of equity shares by investment analysts. Valuation multiples are also used by investors to assesses firms seeking an initial public offering (Schreiner, 2007). Valuation multiples are used to supplement

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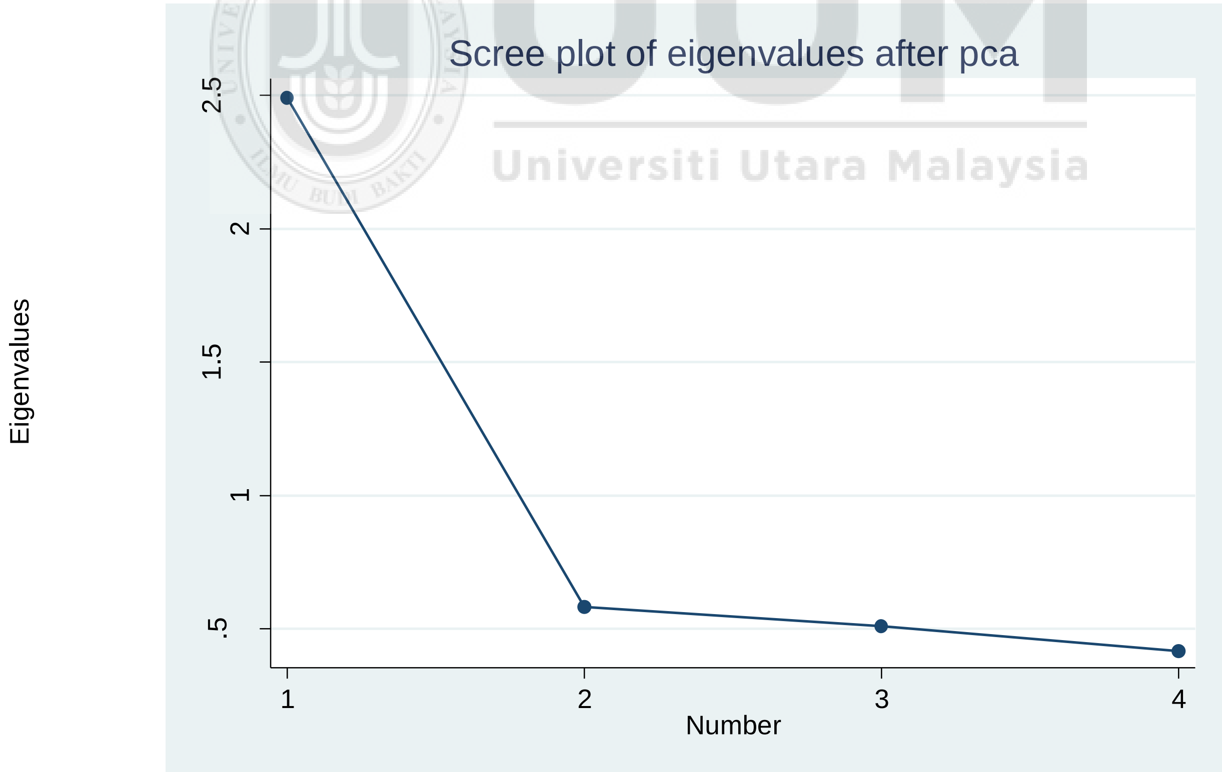
Appendix A

Principal Component Analysis Results

```
pca pe1 pb1 ps1 pc1

Principal components/correlation                  Number of obs    =       500
                                                  Number of comp.  =         4
                                                  Trace            =         4
    Rotation: (unrotated = principal)             Rho              =    1.0000

    --------------------------------------------------------------------------
       Component |   Eigenvalue   Difference         Proportion   Cumulative
    -------------+------------------------------------------------------------
           Comp1 |      2.49083      1.90813             0.6227       0.6227
           Comp2 |      .582702     .0733121             0.1457       0.7684
           Comp3 |       .50939     .0923132             0.1273       0.8957
           Comp4 |      .417077            .             0.1043       1.0000
    --------------------------------------------------------------------------

Principal components (eigenvectors)

    --------------------------------------------------------------------
        Variable |    Comp1     Comp2     Comp3     Comp4 | Unexplained
    -------------+----------------------------------------+-------------
           lnpe1 |   0.4795    0.7966    0.1107    0.3512 |           0
           lnpb1 |   0.5246    0.0735   -0.3497   -0.7727 |           0
           lnps1 |   0.5025   -0.4641   -0.5056    0.5258 |           0
           lnpc1 |   0.4923   -0.3804    0.7809   -0.0554 |           0
    --------------------------------------------------------------------

.
```

```
estat kmo

Kaiser-Meyer-Olkin measure of sampling adequacy

    -----------------------
        Variable |     kmo
    -------------+---------
             pe1 |  0.8091
             pb1 |  0.8074
             pc1 |  0.7830
             ps1 |  0.7830
    -------------+---------
         Overall |  0.7872
    -----------------------

. screeplot
```



APPENDIX B

Summary of Descriptive Statistics

summarize bosize boid size nse_age1 industy1 ceopd1 female1 cgdi1 adircom1 risk1 msh aci_01 pca/evm tl_ta

Variable	Obs	Mean	Std. Dev.	Min	Max
bosize	500	9.568	2.958866	5	20
boid	500	.63524	.170742	.17	1
size	500	7.278	.8806313	5.71	9.59
nse_age1	500	22.68	14.42407	4	68
industy1	500	.41	.4587165	0	1
ceopd1	500	.648	.4780723	0	1
female1	500	.906	1.019432	0	6
cgdi1	500	.47	.499599	0	1
adircom1	500	100.018	70.335	3.463	532.1043
risk1	500	.524	.5039165	0	1
msh	500	.56998	.24302	0	.78451
aci	500	.6437	.1538397	.33	.93
pca/evm	500	4.4110	1.172601	-4.311341	15.24245
tl_ta	500	.57424	.271438	-2.53	1.23

Appendix C

GMM Results for PCA Value

```
xtabond2 PCAV l.  PCAV  bosize boid female audits ceopd audits cgdi1 adircom riskv
mash nse_age1 size industy Yrddum3 Yrddum4 Yrddu m5, gmm (industy riskv size audits
ceop ceopd audits cgdi1 mash adircom, lag (1 2)) twostep Favoring space over speed.
Two-step estimated covariance matrix of moments is singular. Using a generalized
inverse to calculate optimal weighting matrix for two-step estimation
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: cid                             Number of obs      =       500
Time variable : year                            Number of groups   =       100
Number of instruments = 84                      Obs per group: min =         5
Wald chi2(16) = 459170.93                                      avg =      4.00
Prob > chi2   =     0.000                                      max =         5
------------------------------------------------------------------------------
        PCAV |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        PCAV |
         L1. |    .031002   .0027433    11.30   0.000     .0256252    .0363787
             |
      bosize |   .0876237   .0014348    61.07   0.000     .0848115    .0904358
        boid |    1.71748   .0228534    75.15   0.000     1.672689    1.762272
      female |   .0512283   .0099344     5.16   0.000     .0317573    .0706994
      audits |   .0236042   .0028869     8.18   0.000      .017946    .0292624
       ceopd |   .0036685   .0050969     0.72   0.472    -.0063212    .0136582
       cgdi1 |   .0177783   .0039302     4.52   0.000     .0100752    .0254814
     adircom |  -.0000115   .0000215    -0.54   0.592    -.0000536    .0000306
       riskv |   .0319658   .0075568     4.23   0.000     .0171547    .0467769
        mash |   5.320008   8.750009     6.07   0.000     3.600008    7.030008
    nse_age1 |  -.0012824   .0004106    -3.12   0.002    -.0020872   -.0004777
        size |   .0172589   .0050063     3.45   0.001     .0074467    .0270711
     industy |  -.0405922   .0110076    -3.69   0.000    -.0621667   -.0190178
     Yrddum3 |   -.010908   .0013462    -8.10   0.000    -.0135465   -.0082696
     Yrddum4 |  -.0045279    .001735    -2.61   0.009    -.0079285   -.0011274
     Yrddum5 |  -.0027761   .0017522    -1.58   0.113    -.0062103     .000658
       _cons |   -.574005   .0393659   -14.58   0.000    -.6511607   -.4968492
------------------------------------------------------------------------------
```

```
Instruments for first differences equation
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(1/2).(industy riskv size audits ceop ceopd audits cgdi1 mash adircom)
Instruments for levels equation   Standard     _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.(industy riskv size audits ceop ceopd audits cgdi1 mash adircom)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -1.70  Pr > z =  0.090
Arellano-Bond test for AR(2) in first differences: z =   0.01  Pr > z =  0.988
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(67)   =  80.15  Prob > chi2 =  0.130
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(67)   =  70.44  Prob > chi2 =  0.363
  (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(35)   =  28.64  Prob > chi2 =  0.767
    Difference (null H = exogenous): chi2(32)   =  41.80  Prob > chi2 =  0.115
```

PRICE-TO-EARNINGS MULTIPLE

```
xtabond2   pe l. pe bosize  boid female audits ceop audits cgdi1  mash  adircom
dirshar riskv nse_age1 size  industy  Yrddum3  Yrddum4 > Yrddum5, gmm (industy riskv
size audits ceop ceopd dirshar  mash audits cgdi1 adircom, lag (1 2)) twostep
Favoring space over speed. To switch, type or click on mata: mata set matafavor
speed, perm.
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: cid                             Number of obs      =       500
Time variable : year                            Number of groups   =       100
Number of instruments = 94                      Obs per group: min =         5
Wald chi2(16) =  4.81e+07                                      avg =      4.00
Prob > chi2   =     0.000                                      max =         5
------------------------------------------------------------------------------
          pe |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          pe |
         L1. |   .0433621   .0192226     2.26   0.024     .0056864    .0810377
             |
      bosize |  -1.458351   .1131935   -12.88   0.000    -1.680206   -1.236495
        boid |   1.405832   1.279471     1.10   0.070    -1.101885    3.913548
      female |   .8116954   .1622796     5.00   0.000     .4936333    1.129758
      audits |   1.712751   .1658546    10.33   0.000     1.387682     2.03782
        ceop |  -.7322834     .01969   -37.19   0.000     -.770875   -.6936918
       cgdi1 |   6.426462   .4737718    13.56   0.000     5.497887    7.355038
        mash |   3.452306   6.934307     4.98   0.000     2.096506    4.812106
     adircom |    .091572   .0018166     5.04   0.000     .0055967    .0127177
       riskv |  -3.489542   .3174626   -10.99   0.000    -4.111757   -2.867327
    nse_age1 |    .101238   .0217482     4.66   0.000     .0586123    .1438637
        size |   5.154576   .4381251    11.77   0.000     4.295866    6.013285
     industy |  -6.534906   .5840852   -11.19   0.000    -7.679692    -5.39012
     Yrddum3 |   -4.13001   .1590264   -25.97   0.000    -4.441696   -3.818324
     Yrddum4 |  -4.593725    .319141   -14.39   0.000    -5.219229    -3.96822
     Yrddum5 |   -3.02907   .3574466    -8.47   0.000    -3.729653   -2.328488
       _cons |  -23.78732   2.909483    -8.18   0.000     -29.4898   -18.08484
------------------------------------------------------------------------------
```

```
Instruments for first differences equation
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(1/2).(industy riskv size audits ceop ceopd dirshar mash audits cgdi1
    adircom) Instruments for levels equation Standard _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.18  Pr > z =  0.029
Arellano-Bond test for AR(2) in first differences: z =   1.14  Pr > z =  0.256
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(77)   =  45.42  Prob > chi2 =  0.998
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(77)   =  82.21  Prob > chi2 =  0.321
  (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(41)   =  43.28  Prob > chi2 =  0.374
    Difference (null H = exogenous): chi2(36)   =  38.93  Prob > chi2 =  0.339
```

PRICE-TO-CASH FLOW MULTIPLE

```
xtabond2  pc l. pc osize  boid female audits  ceopd audits cgdi1 adircom riskv  mash
nse_age1 size  industy Yrddum3  Yrddum4 Yrddum5, gmm (industy riskv size audits ceop
ceopd audits cgdi1  mash adircom, lag (1 3)) twostep Favoring space over speed. To
switch, type or click on mata: mata set matafavor speed, perm.
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: cid                             Number of obs      =       500
Time variable : year                            Number of groups   =       100
Number of instruments = 100                     Obs per group: min =         5
Wald chi2(16) =  1.21e+06                                      avg =      4.00
Prob > chi2   =     0.000                                      max =         5
------------------------------------------------------------------------------
          pc |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          pc |
         L1. |   .1464317   .0154548     9.47   0.000     .1161408    .1767225
             |
      bosize |  -.8090781   .0963141    -8.40   0.000    -.9978504   -.6203058
        boid |   2.651457   2.221757     1.19   0.233    -1.703106    7.006021
      female |   1.430104   .1509913     9.47   0.000     1.134167    1.726042
      audits |    1.18516   .1089447    10.88   0.000     .9716319    1.398687
       ceopd |   .7691386   .3789279     2.03   0.042     .0264535    1.511824
       cgdi1 |   2.888586   .2843545    10.16   0.000     2.331261     3.44591
     adircom |  -.0151596   .0011237   -13.49   0.000     -.017362   -.0129572
       riskv |   1.241599   .5339382     2.33   0.020     .1950991    2.288098
        mash |   1.480006   6.410007     2.31   0.021     2.250007    2.740006
    nse_age1 |    .005285    .019835     5.81   0.015     .0764091    .1541608
        size |   1.691083   .5571205     3.04   0.002      .599147    2.783019
     industy |  -1.450599   .7307452    -1.99   0.047    -2.882834   -.0183651
     Yrddum3 |  -2.633338   .2571898   -10.24   0.000    -3.137421   -2.129255
     Yrddum4 |  -1.639234   .2602618    -6.30   0.000    -2.149338    -1.12913
     Yrddum5 |  -3.393602   .2748841   -12.35   0.000    -3.932365   -2.854839
       _cons |  -12.31015   4.275978    -2.88   0.004    -20.69091   -3.929387
------------------------------------------------------------------------------
Instruments for first differences equation
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(1/3).(industy riskv size audits ceop ceopd audits cgdi1 mash adircom)
```

```
Instruments for levels equation   Standard     _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.(industy riskv size audits ceop ceopd audits cgdi1 mash adircom)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.90  Pr > z =  0.004
Arellano-Bond test for AR(2) in first differences: z =  -0.55  Pr > z =  0.581
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(83)   =  95.35  Prob > chi2 =  0.167
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(83)   =  88.65  Prob > chi2 =  0.315
  (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(51)   =  57.16  Prob > chi2 =  0.257
    Difference (null H = exogenous): chi2(32)   =  31.49  Prob > chi2 =  0.492
```

PRICE-TO-SALES MULTIPLE

```
.xtabond2  ps l. ps  lbosize  lboid female laudits  ceopd cgdi1 adircom riskv  mash
nse_age1 size  industy Yrddum3  Yrddum4 Yrddum5, gmm (I ndusty riskv size audits ceop
ceopd cgdi1  mash adircom, lag (1 3)) twostep Favoring space over speed. To switch,
type or click on mata: mata set matafavor speed, perm.
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: cid                             Number of obs      =       500
Time variable : year                            Number of groups   =       100
Number of instruments = 100                     Obs per group: min =         5
Wald chi2(16) = 562477.55                                      avg =      5.00
Prob > chi2   =     0.000                                      max =         5
------------------------------------------------------------------------------
          ps |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          ps |
         L1. |   .3642835   .0111744    32.60   0.000     .3423821     .386185
             |
      bosize |  -.0623828   .1061912    -0.59   0.557    -.2705137    .1457481
        boid |   .1251508   .0948461     1.32   0.187    -.0607441    .3110457
      female |  -.4438451    .024185   -18.35   0.000    -.4912468   -.3964434
      audits |   1.224203   .0908278    13.48   0.000     1.046184    1.402222
       ceopd |   .6424703   .0500958    12.82   0.000     .5442843    .7406563
       cgdi1 |   .4372114   .0664237     6.58   0.000     .3070235    .5673994
     adircom |   .0007854   .0002768     2.84   0.005      .000243    .0013279
       riskv |  -.5521871   .0583355    -9.47   0.000    -.6665227   -.4378516
        mash |   1.292306   6.872308    18.75   0.000     1.152306    1.422306
    nse_age1 |   .0304239   .0030478     9.98   0.000     .0244503    .0363974
        size |   .6241043   .0622783    10.02   0.000      .502041    .7461676
     industy |  -.3428345   .0786858    -4.36   0.000    -.4970558   -.1886132
     Yrddum3 |  -.3285319   .0191892   -17.12   0.000    -.3661421   -.2909217
     Yrddum4 |  -.0425719   .0235951    -1.80   0.071    -.0888175    .0036737
     Yrddum5 |   .1426626   .0227402     6.27   0.000     .0980926    .1872325
       _cons |  -5.015271   .4345275   -11.54   0.000    -5.866929   -4.163613
------------------------------------------------------------------------------
Warning: Uncorrected two-step standard errors are unreliable.

Instruments for first differences equation
```

```
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(1/3).(industy riskv size audits ceop ceopd cgdi1 mash adircom)
Instruments for levels equation   Standard     _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    D.(industy riskv size audits ceop ceopd cgdi1 mash adircom)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -1.53  Pr > z =  0.026
Arellano-Bond test for AR(2) in first differences: z =  -0.34  Pr > z =  0.731
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(83)   = 127.95  Prob > chi2 =  0.101
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(83)   =  74.82  Prob > chi2 =  0.727
  (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(51)   =  47.94  Prob > chi2 =  0.121
    Difference (null H = exogenous): chi2(32)   =  26.88  Prob > chi2 =  0.724
Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(11)   =   9.56  Prob > chi2 =  0.570
    Difference (null H = exogenous): chi2(32)   =  35.99  Prob > chi2 =  0.287
```

PRICE-TO-BOOK VALUE MULTIPLE

xtabond2 pb1 l. pb1 bosize boid female audits ceopd audits cgdi1 adircom riskv lnmash nse_age1 size industy Yrddum3 Yrddum4 Y rddum5, gmm (industy riskv size audits ceop ceopd audits cgdi1 mash adircom, lag (2 4)) twostep Favoring space over speed. To switch, type or click on mata: mata set matafavor speed, perm.

Dynamic panel-data estimation, two-step system GMM

```
------------------------------------------------------------------------------
Group variable: cid                             Number of obs      =       500
Time variable : year                            Number of groups   =       100
Number of instruments = 76                      Obs per group: min =         2
Wald chi2(16) =   4250.76                                      avg =      3.93
Prob > chi2   =     0.000                                      max =         4
------------------------------------------------------------------------------
         pb1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         pb1 |
         L1. |   .1797354   .0105767    16.99   0.000     .1590054    .2004654
             |
      bosize |   .4872032   .0233258     3.74   0.000     .0414854     .132921
        boid |   -.061667   .2693297     3.83   0.000     .5037909    1.559544
      female |   .0598979   .0336194     3.57   0.320     .0540051    .1857907
      audits |  -.3274104   .0489028    -3.22   0.001    -.2532581   -.0615627
       ceopd |   .0397531    .143862     0.28   0.782    -.2422112    .3217174
      cgdi1  |   .0005336   .1210414     3.23   0.001     .1532968    .6277704
     adircom |  -.0028489    .000525    -5.43   0.000    -.0038778     -.00182
       riskv |  -.2023549    .116521    -1.74   0.042    -.4307319    .0260221
        mash |  -3.653207   1.641327    -1.14   0.932    -5.083207    1.346507
    nse_age1 |    .029773   .0052332     5.69   0.000     .0195161    .0400299
        size |   .0117439   .0867305     0.14   0.892    -.1582447    .1817325
     industy |  -.8081158   .2064753    -3.91   0.000      -1.2128   -.4034317
     Yrddum3 |  -.3096286   .0315025    -9.83   0.000    -.3713723   -.2478849
     Yrddum4 |  -.2547391   .0471673    -5.40   0.000    -.3471854   -.1622928
     Yrddum5 |  -.2546954   .0592853    -4.30   0.000    -.3708924   -.1384984
       _cons |  -1.014473    .593426    -1.71   0.087    -2.177566    .1486211
------------------------------------------------------------------------------
Instruments for first differences equation
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(2/4).(industy riskv size audits ceop ceopd audits cgdi1 mash adircom)
```

```
Instruments for levels equation
  Standard     _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.(industy riskv size audits ceop ceopd audits cgdi1 mash adircom)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.23  Pr > z =  0.005
Arellano-Bond test for AR(2) in first differences: z =  -1.46  Pr > z =  0.311
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(59)   = 111.46  Prob > chi2 =  0.100
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(59)   =  52.72  Prob > chi2 =  0.705
  (Robust, but weakened by many instruments.)
Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(35)   =  29.18  Prob > chi2 =  0.374
    Difference (null H = exogenous): chi2(24)   =  23.54  Prob > chi2 =  0.488
```