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# The Role of Capital, Liquidity and Credit Growth in Financial Crises in Latin America and East Asia

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e consrc d se of b n c p deq cy nd q d y o es herre ronsh ps o crises n As nd L n A erc E en s d es og nd OC es rons s gges hese r b es re b e e d ng nd c ors of crises hey c n b e sed o r proje E r y rning ys e des gn h o g here re r de offs b e een ode s p c y h c h r p es ess on oring cos s nd co pe y h c h y pro pr r r

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ecen y, of nd en s of **b** n ng oper rons  $n_{y}$  e rece<sub>be</sub> ed r despre d en ron fro reg ors nd r e s, c pr nd q d y Aggreg ed r croecono r c n deq c es r n "nese o<sub>y</sub> r **b** es gener ed sys e r c f n ncr r ns **b** r y "r c'n ed o "ne os cos y nd g o**b** r sed cr s s s nce "ne re Depress on C essens e

Ano o sy, fe s dies have ined he direc i p c of c pi deq cy nd iq id y on **b** n ing crisis pro**b** bit i es nd cer in y none, o o r no edge, on L in A eric n nd As n **b** n ing syste s ince igher in ern ion s nd rds in hese, r **b** es re d, oc ed by reg ors, here sho d **b** e es r **b** e red c ion in **b** n ing crisis pro**b** bit i es cross regions, inc ding in e erging r es i ho his, s ricer c pi nd iq id y req i re ens y cred prograsion nd c se ore disiner ed i on in so e regions co p red o o hers

The **b** n ring crisis r er re o d e gener es differen ind of en conficing concisions so e of "hchhhy e been sed o inderpin poicy ers chinges o e rising regions ng ribys chis dies rely on dagerse ringes of cross sections, ribe periods, ribes ind esriors nd ye, ern rige odes reino ro rinely coller ring rindic ors ind f clores chis he ype of esrior, "he inform ron content of collering rindic ors ind "he forecising" e of odes "hige be ring on regions crissing structure prindices relief indir q ridiys indirds reinecess ry o red cef i rely system res

h s p per ddresses so e of hese deficiencies in he i er re by foc sing on he ro e of c p nd iq id y specific y in L in A eric nd Asi e high e p ins ing y co ec ed c p deq cy d for s p e of b n ing syste s contering As prei in ry ssess en of hese ne series nd s nd rd crisis de er in n s e se n e en s dy ppro ch hich iden fres ribes hoen is signific n y differen y d ring periods of ins b i y nd r nq i y

C p' nd 'q' d' y re 'nen 'n rod ced 'n og' fr e or ongs de s nd rd **b** n 'ng criss's de er 'n n s o see 'f, s B se ss es, 'ne 'n er c p' nd 'q' d' y pos' 'ons red ce cris's pro**b b**' ' 'es 'n 'nese regions e find 'n c p' nd 'q' d' y do ' 'g e crises **b** on y 'n poo ed s pe since 'ne re 's e' por nce of e c'n differs **b** e een As n cr ses ere preceded by b nce of p y en s prob e s n

#### Section 2: Capital, Liquidity and the Asian and Latin American Crises

n his section e retrie he retrionships beten c providiy nd bin ing crises O r retrining ribes have been e enside y discissed in he e in i er rets chis Detrig c in ind Derigiche Dationships nd ribere en sof he Asin ind L in A eric in crises before rning o discissions of o rid indiendo ogies in he sibseq en section

### he oe of C p' 'n 's ed c'on

A is os b sice e her ion e for c p b ffers is in i b e nd no niq e ob n ing fir s by er r ing porton of f nds c p o co er de erfor ions on he sse side of he b nce shee, fir c n red ce is insolvency r es 'o e er designing pr cic r es o r ns e his in o op c p r ios is no s in i b e for reg ors ince heory s gges s c p i bertis red cing on y nder specific conditions hich re no e si ye ec b e s reg ory r es, he f benefits y no be obserted in pr cice. As e i disc ss, his durates end right of the price regionship be een c p nd crists ris

\*here re o ypes of 'heore' c s dies 'n foc s on b n c p' , por fo'o b sed ppro ches nd odes 'n foc s on 'he specific re 'ons'h ps be een b n 'ng fir s, deposiors nd borro ers Bo'n ppro ches re reconci b e in 'n 'hey s gges c p' , 'g e b n s syse 'c r s e pos res b by o 'ng for de ber e r s 'ng by b n n gers 'hey pred c ', 'ed benefic' effec s

nd rd por fo 'o 'heory's ggess 'n por fo 'o consisting of s fficienty rgen bers of ncorre ed sse re rns ' req 're no c p' b ffers d e o perfec digers fic 'on n re 'yb n por fo 'os ' be' perfec y digers fied nd 'n s con 'n eno g'n syse 'c nd 'd osyncr 'c ris o s'fy 'he need for c p' b ffers sing 'he er 'no ogy of Fre's nd oche e c n define 'he reg ors probe 'he ob ec igers o se desired b n sogency prob b''y nd 'hen derige 'he ppropri e c p' r 'o 'h'c'n 'h nges on 'he b n s sse e pos res nd 'he'r corre 'ons

Le **be** he prob **b**<sub>1</sub>, y of so, ency so h 1 , s he f, rer e E ch **b** n , h, e e pos res o cred, or nd h s e pos re, s s **b** ec o s och s, c oss per do r of e pos re defined s Le **b** e he ggreg e oss on por fo, o of sse s he o oss on he por fo, o, s hen g, en by

#### 1

o  $\sum_{\mathbf{n}} \mathbf{o} \cdot \mathbf{d} \mathbf{b}$  n r p cy, s ffr cren c production s  $\mathbf{b}$  e he d s ch homological does no occ r n er s of region c production s  $(\mathbf{b} \cdot \mathbf{r} \cdot \mathbf{r})$  s  $(\mathbf{b} \cdot \mathbf{r})$  s  $(\mathbf{c} \cdot \mathbf{r})$  s  $(\mathbf{c$ 

hereg or c n no se s ch h

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As ordy s gges s, b n por fo, os of cons er o ns y be gr n ed eno g'n o  $d_{xy}$  ers, fy y cons, der b e o ns of, d osyncr, c r, s b bec se borro er n bers r ed, 'n

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once r r ed r b r r y depositions recent e risis, oche sho sin risib sed c prr es cinno e rith e or in zird i ence in sic printeore rici y red ces crisis risi, inprici ce in seffec rithe sible contre prici ces of ine bin ring syste ind ine rins ritionfrie or ritioper es inder i ence ine e pecied neg right e re ritions in plue een ciprideq cy indicrisis probibirity y no ys indice principal

#### Lq, dy, s nd B n, ng Cr ses

L q 'd' y 's ' por n for **b** n s **b**' ' y fro o perspectives, 'he f nd ng s'de nd 'he r e s ssess en of **b** n s sse q ' y 'he o c'h nne s re s rong y 'n ed 'n 'h de er or 'ons of sse prices c n co pro 'se **b** n s **b**' ' y o r 'se f nds 'n 'he r e A 'he s e ' e, ccep nce of 'h's 'q 'd' y r's 's n 'n'heren p r of **b** n s  $c_{kq}$  ' es s q ' y 'he se r nsfor ers 'n 'he process of prog 'd ng 'q 'd' y ns r nce o depos' ors

n he se in p pers of Bry n nd Di ond nd Dyby g for s re ode ed s iq id y ins r nce providers Ass ing deposiors re ris erse, fon s re ris ne r nd in he f ce of po en i iq id y shoc s, he P re o op i oc ion of endo en occ rs hen deposiors oc e f nds o fon s nder fr c ion reserve syse his o co e do in es r y nd fond r e oc ions for res s in ninheren y ns foe si ion since fon s s in es in i iq id pro ec s his in ninheren y ns foe s pion h in ggreg e, i hdr s i s isfy no n profotor y he i e i hood of iq id y shoc for e, er if p ien deposior nicip es o her deposiors i in indr she is so forced in he fosence of iq id y shoc s o i hdr since e r y iq id ion of i iq id pro ec s e ns fon s sse es re ess h nis i for i es

, 'ndr of f nds d e o c of co ord n 'on ongs depositors e ds o n inefficien oc 'on, 'b n r ns 'n c'n re ssoci ed 'n sys e 'c b n ing crises De 'rg c n nd De r g' c'ne, nd s rong y dependen on e pec 'ons 'n s er c'n nne cre es

Never he ess,  $r_1$ 's re son b e o ss e h here b n d'd en er he rs,  $r_2$  o d'h e been sys e  $rc_2$  y por n r n he oo brg of  $r^2$  sense nd h s sc p r  $r_2$  o d be corre ed r h he he h of he frinnce sys e l'ence ho gh o r c p d y no con r n he trince ssoce ed r h p r  $rc_2$  r b n rng sys e  $r_2$  sho d be brod y represen  $r_2$  e of r s c p so ndness F de r s of he b n cover ge for e ch con ry re  $g_{r_2}$  en r he d ppend

Fro on rds, e re, er o he MFs of Frnnc, fr, y epors o of n c p, deq cyr os for he en refnngsyse L e he B n er, hese d re rs eighed ccording o B reg ory req re en s he fin

deb crises "here "higher been re inger y fe egen s dies on bin inger ses, o rinc" is nd Obs fed being recen e ception here Y, is he bening crisis d y for conry i e is he ecor of coefficiens, X, is he ecor of e p n ory r bes nd F X, is he c is e og sic dis r b ion he og i e hood finction hich is sed o ob in c pr e erest ests  $g_{ij}$  en by

$$Log_{e} L = \prod_{i=t=1}^{n-T} \left[ (Y_{it} \circ g_{e} F(\beta X_{it})) + (-Y_{it}) \circ g_{e} (-F(\beta X_{it})) \right]$$

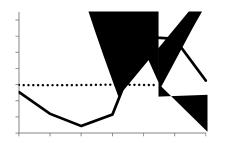
A ho g'n he signs on he coefficients releasing y interpreted strepresenting n increasing or decreasing effection crisis probleting, y he rgin we are not sign in the origin effects of the right of n erpre Equipped on shows the coefficients on X, reno consin rgin effects of the right of other in right or sist probleting since the right of estimates of the right of the set of the right of the right of the set of the right of the right of the set of the right of the

n, e nye n s dres 'n c'n se con e por neo sindependen ribes eg De irg c n nd Der giche, e g independen ribes so s o ob in id E see Brre e e so es do n fro gener eq ion i'n ribes inc ded o 'ne si p es eq ion i'n re ining signific n ribes A e c'ns ge of 'ne es ing do n proced re e ssess 'ne oss of predicing e brir y of 'ne res ing ode sing OC n ys is see ec ion

#### OC C r es

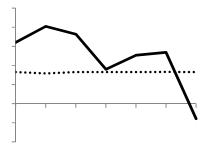
ecce er oper ing chir cerisic OC cries es he si of bin ryc ssifiers nd hence chie sed od scriin e be een copeing odes n'he cone of ogiesi ors, prob bins c forecs schoe c ssified for ccr cy gins conin of hreshods his gener es reposité er e nd renegié er e fore chihreshod nd corresponding y f se posité e nd f se negié er e n'he er ino ogy of OC nigsis, he of the so of in eres reposité y reposité er e nd specificity i e in ere negié er e, his d'his go he f se negié er e n'he renegié er e, specificity i e in ere nd specificity i e in ere negié er e, specificity on he es, s sho n in Fig re

he r e positive nd f se neg to e r es enc ps e he correspondence be een prob bi i si c forec s s nd c bin ry e en s nd gener e o di ension co ordin e in he OC sp ce n rn, he pping be een hese co ordin es nd he hresho ds or decision crierion, define he OC c r e i ence OC c r es re c ose y ssoci ed i h he po er of bin ry predic or





T82093587q 8089395q3R5eT2.9445q3R5eT2.945378339.94719909.94719289R70175219289R



n he c se of As, he rq rd y posr ron of **b** n s s f r ore crirc E, en d ring non crisis periods he ver ge rq rd y r ro s **b** e o he L rn A eric n ver ge of Moreover rn As, he decine s ore pror c ed even ye rs before crisis he s ring eve of rq rd y son y nd persis en signific n decines here fer res ed rn r ro of crisis onse

These p erns ccord is the chronology of Asian crises even s there significen c pi o for sizes ing from fight or q is  $y^{-1}$  efforms is the ccess of finning the size of p in the posicities is representing individually positions the generative por right proved year for crisis onset. By the foroing year, Asian basis individually right proved significantly be on their ring is period even s tence individually right poend of the right of the size of the right period even s tence individually right poend. The right period even the right period even the size of the right period even the right period event the right period even

Do es c Cred DP M eser es C rren Accon DP P nes nd , o e r b es e e r ne do no d sp y no o s b en r o r d r ng ne pre cr s s r ndo s no g'n here re de r ons fro he non cr s s e n n se er c ses, os of hese re no espec y s gn f c n r n er s of he confidence r n er s E cep ons r nc de do es c cred DP, he c rren ccon nd M reser es

"he r ses n do es c cred DP n "he poo ed s

## Log es s

", ng den fred differen poen, e ding crisis indic ors for L in A eric nd Asising the events dy e hodo ogy, e ne disc ss o r res s for the gener o specific og e ercise the og res s c n be sed o s

6e,	ener	0	pec, f, c	es	s for Poo ed	p e
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n u		2								
` a	2	2	2	2				2	2	
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a,≱a A uacy a	2	2		2	2 2	2			2	
u n Acc un Ba anc	2	2	2	2 2	2	2	ŗ	1	1	• •

## **b**e, ener o pec<sub>1</sub>f<sub>1</sub>c es s for As<sub>1</sub>

`` n u		2								
u n Acc un Balanc	2	2	22	2 2 2	2					2
Luya	2	2 2		2 2					2	
` a					2 2			2	2	2
,≱a,≱a				22	2					
,		Bu	1	2		1	I	1	1	ı 1

Bu Ba anc 22

**b** e sho s he co per ng ode s for he As n econo res n conr s o he poo ed res s, e e ed do es c cred. DP nd ns ff cren c p deq cy do no pper o precede crises ns e d, he c rren cco n **b** nce, er s of r de nd rq d y r ros re r por n crisis predicors hese effects pper rob s n h he coefficients re in fir y s **b** e hro gh n ne ronds of r **b** e de e ons

he res s ccord , h he chrono ogy of he As, n crises, riggered by red cion in de nd for he region se por s c rren ccon , b nces fin nced by spec i e c p inf o s nd de erior ing b n i q i d y positions once hese inf o s regiered he res s re so in ine i h he e en s dies hich i den field e y r er en rons b sed on der se of rge r b es ny se of rge r b es n en er ne E s be scr n sed by he porcy er nd re r e y o be en c ed pon f de r ons beco e signific n

e y ho e er be in eres ed in he infor i on con en of ribes h do no s rive he gener o specific de e on process her re o y rise fro ribe in er cions e c nno c p re in iner fre or so h her bi y o e p in dosyncric crises is os hen er n he g ins ore do in n co per ors n s ch c ses, he s i of he res ing p rs on o s ode y be inferior o he e ended, ers on con ining he de ed ribes

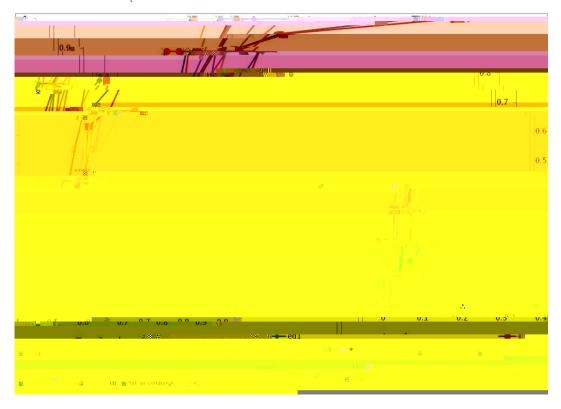
Porcy ers r'n srong ers on ocrises r's'n oc s ny episodes spossible e en ne cos of ris en sign s for ne ne cos of ype error fri re oc crisis r's ng'ner n'n ne cos of ype error f se r On ne o'ner n'n d, if n e ended ode con rins no ddr on rinfor ron e, ne s e porcy er y prefer ne p rs onro sers on, ss ring cos s of on or ng nd ner, en on e is

nfor , on 🙀

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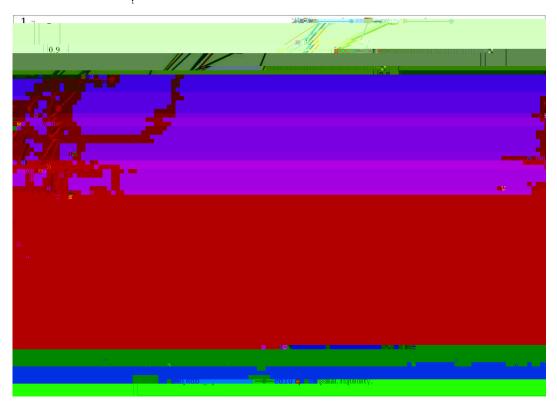
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## F'g re, OCC $r_{r_{ij}}$ es for ener o pec f'c As' Mode

 $F_r g re$ , OCC  $r_{r_r} es$  for ener o pec<sub>r</sub>  $f_r c L_r n A$  er c Mode



regression, "hich con ins' ore ribes "nin he rinc ed ode bidge bince, er sof ride, M reserges, cirren coon, DP gro "nind e c'ninge ries" i en he incre sed on oring coss "ni o dires fro sing "hese e ended ode sigers sine siccinc ersions, e e e he oss in er sof crisis ci sind non crisis ci sine in si pe "hresho di "hese resis resho nin be"

#### **b** e', Co p r sons of Mode Acc r cy

C p deq cy nd (q, d, y, r) os pper o s persede ny r d (on crisis) de er (n n s s e d ng (nd c ors nd c n h s be sed o (prope E) des gn for hese regions n his cone (here re r de offs be een ode s (pic y) hich (pies ess on or ng cos s nd co pe (y hich y) prope cc r cy 'o e er A Cs sho 'n c p nd (q, d, y c n be sed (n prs) on o s ode (hon ny s b s n) oss (n crisis predicing e cc r cy (n e) her region

O r res s'n  $e_{i}$  p  $c_{i}$  ons for As n nd L in A er c n f n nc reg ors concerned i n 'n 'n 'p c s of B se on 'ner b n ing sys e s 'ne incre sed c p nd iq id y s nd rds co d 'n e benefici i p c in L in A er c b 'n g'ner c p r i os y nnecess r y As n b n s i en 'n e find no direc roe for credi gro 'n 'n e i p c of co n ercyc i c p b ffers need o be e ed in bo'n regions O r res s provide s r ing poin for f r her n ys s eferences,

Ach ry , nd , s n h n,  $Le_{y}$  er ge, Mor <sup>\*</sup> z rd nd Lq, d  $\hat{y}$  he orn of F, n nce, o <sup>''</sup>, pp

Az z, 'n ng r, C r zz, Fr ncesco nd g do, n/ C rrency Cr ses, n e rc'n of Co on E e en s MF or , ng P per, o , pp

B nde 'gn 'A nd A 'nson, P 'h'n 'ng Beyond B se ', Necess ry o 'ons for C p' nd L q 'd' ÿ OECD o rn ', F'n nc' M r e rends, o e , ss e

Bor, o, C, Dreh nn, M,  $\mathbf{b}$  cor, L,  $\mathbf{r}$  enez, nd r ch r e, C, Co n ercyc c c p  $\mathbf{b}$  ffers e p or ng op  $\mathbf{r}$  ons *BIS Working Paper* no , B n for n ern  $\mathbf{r}$  on e e en s

Bor, o, C nd Dre'n nn, M, Assessing 'he ris of (an ing crises registed). BIS Quarterly Review, M rc'n, pp B n for n ern i on e e en s

Bry n, A Mode of eser, es, B n ns nd Depos, ns r nce o rn of B n, ng nd F, n nce, o pp

C rs ens, A r' rdy, D C, nd P z r s s o g, C, B n rng Cr ses rn L rn A errc nd he Porrc Econo y of Frn ncr ec or Porcy n ern ron Mone ry F nd, P per prep red for he se rn r or ern en s nd B n s, espons br r r es nd L r s, DB C Ann Meerngs

C essens, , De Arr.cc, , g n, D nd L e, en, L Cross co n ry e per ences nd porcy , pro rons fro he g of frn nc/cr s/s<sup>-</sup>, Econo rc Porcy, , '

 $D_{y_1}$ 's, E P nd r, D Co p r ng E r y rn ng ys e s for B n ng Cr ses, o rn of F n nc br y, o pp

 $D_{int}$ 's, E P, r, D nd L dze, ... 'no d  $M_{int}$  r, e E r y, rn, ng ys e s For B n, ng Cr ses Poo Across eg ons 'end e of or d Econo r cs, o ..., No ... pp '

De rg c n, A nd De r g che, E he De er rn n s of B n rng Crises rn De e oped nd De e oprng Con ries MF ff P pers, No pp

De  $rg_{j}$  n A, nd De r g che E, Cross Con ry E p r c d es of ys e c B n D s ress, A r ey MF or ng P per ', n ern on Mone ry F nd Dr ond, D nd n, A heory of B n C pr , o rn of Frn nce, o No', pp

E c'hengreen, B, ose, A nd yp osz, C E c'h nge M r e M y'he , 'he An eceden s nd Af er 'h of spec  $_{h_{e}}$  e c s; *Economic Policy*, o , No pp

 $F = (E,F,F,s^{*}her,L), ensen, M, nd o )$  "he Ad s en of oc Prices o Ne nfor 'on", nern 'on Econo 'c e je , o , p ge

Fr n e, A nd ose, Andre 'C rrency cr shes, n e erg, ng r e s, An e p, r, c re en orn of n ern on Econo , cs, E se, er, o p ges

Free s,  $X_{ref}$  er nd oche, en Chres he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microecono i cs of B n i ng<sup>-</sup>, he Microeco

ordy, M B A 's f c or Mode Fo nd 'on for 'ngs b sed B n C p' es o rn of F n nc' n er ed' 'on, pp

o r'nc'n s P'erre O ', o

Me z, C'n r es, E  $ecc_{r}$  er Oper r ng C'n r c er s r c An ys s, A oo for 'ne Q n  $r_{r}$  e E r on of Obser er Perfor nce nd g ng ys e s o rn of 'ne A er c n Co ege of d o ogy, o e ss e', ne ', P ges

Pero , E nd rez, Lq d y , s Ch rges s M cropr den ,  $oo^{\sim}$  CEP , Por cy nsigh, No , Cen re for Econo , c Por cy ese rch

oche, C C p' eq re en s nd he Beh  $_{\mathbf{y}}$  o r of Co erc' B n s E rope n Econo r c  $\mathbf{e}_{\mathbf{y}}$  e , o ' , pp D Append,