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Abstract Do governments in less-democratic newly industrialized countries (NICs) bargain with their citizens? In this article we develop a game-theoretic model to show that the government may not be able to avoid bargaining in open economies such as the Asian NICs when economic conditions are less than optimal. The reason is that, in the absence of government bargaining, citizens acting rationally and strategically choose to withdraw resources such as labor or production investment from a weak economy. Under these circumstances, government bargaining to elicit resource investment is a sub-game perfect equilibrium outcome. To test the model, we analyze data on production investment in the Asian NICs of South Korea, Taiwan, Singapore, and Malaysia from the 1960s to the 1990s.	

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BARGAINING IN LESS-DEMOCRATIC NEWLY INDUSTRIALIZED COUNTRIES

MODEL AND EVIDENCE FROM SOUTH KOREA, TAIWAN, SINGAPORE, AND MALAYSIA

O. Fiona Yap

ABSTRACT

Do governments in less-democratic newly industrialized countries (NICs) bargain with their citizens? In this article we develop a game-theoretic model to show that the government may not be able to avoid bargaining in open economies such as the Asian NICs when economic conditions are less than optimal. The reason is that, in the absence of government bargaining, citizens acting rationally and strategically choose to withdraw resources such as labor or production investment from a weak economy. Under these circumstances, government bargaining to elicit resource investment is a sub-game perfect equilibrium outcome. To test the model, we analyze data on production investment in the Asian NICs of South Korea, Taiwan, Singapore, and Malaysia from the 1960s to the 1990s. The analysis supports the prediction of the formal model and, hence, makes three contributions to the study of this topic. First, when we relax the assumption that citizens are naïve, governments in less-democratic open economies such as the Asian NICs may not be able to avoid bargaining with their citizens. Second, resource-withholding or withdrawal is an equilibrium strategy that convinces the government to bargain. Third, governments may bargain credibly even in the absence of formal constraints.

KEY WORDS • credibility • government-bargaining • less-democratic countries • resource withdrawal • self-enforced equilibrium

1. Introduction

In the industrialized democracies, the need to attract electoral support forces governments to bargain with their citizens (Alesina, 1995; Anderson and Ishii, 1997; Pacek and Radcliff, 1995; Palmer and Whitten, 1999; Powell and

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Whitten, 1993; Suzuki and Chappell, 1996). What of the less-democratic newly industrialized countries (hereafter abbreviated as NICs) where few formal constraints exist against the government? Would the government bargain and make concessions to meet citizens' preferences when its tenure in office is not imperiled by competitive elections?

This article develops a game-theoretic model that predicts that, in less-democratic open economies such as the Asian NICs,¹ the government cannot avoid bargaining with its citizens when economic conditions are weak or less than optimal because it needs their resources of labor or production investment (the terms citizens and resource-owners are used interchangeably in this article).² Government bargaining is defined as government attempts to reach its goals of economic, political, or social development subject to the structure of the game and the constraints posed by citizens' preferences and behaviors (see Fink et al., 1998; Fudenberg and Tirole, 1992; Morrow, 1994).

Briefly, the logic of the model is this: the lack of formal constraints against the government encourages citizens to use economic performance as a 'noisy' signal of government competence or corruption to prevent government exploitation.³ In particular, when the economy under-performs, withholding or withdrawing resources is a Nash equilibrium strategy for citizens who do not want to lose further investments (Alesina, 1995; Suzuki and Chappell, 1996). We relax the assumption that resource-owners in the less-democratic Asian NICs are naïve and unable or unwilling to respond to the government – studies show this assumption to be highly restrictive (Alesina, 1995; Ames,

1. Studies consistently classify the Asian NICs as open economies; this assessment is based on a number of criteria, including ease of starting and closing businesses, tariff and trade restrictions, extent of trade, property rights and transparency and consistency in regulation. The classification has persisted even following capital restrictions imposed in Asian NICs such as Malaysia in the aftermath of the Asian financial crisis. See, for instance, Heritage Foundation (1995–2000) and A.T. Kearney (2001–04).

2. The categorization of resources and, hence, resource-ownership, as labor and investment that may be used in production is clearly a simplification used for ease of discussion. Nevertheless, the categorization is not overly restrictive since most resources may be classified into those of labor or for production.

3. Weak economic performance probably reflects a combination of factors that may include worsening terms of trade, decreases in international demand, or poor or incompetent government planning. However, it is nearly impossible to extricate the effects of each contributing factor on economic performance, even after expending a considerable amount of time in the investigation. More importantly, as Alesina (1995) and Suzuki and Chappell (1996) point out, given the absence of political constraints on the government, the immediate interest of resource-investors is to avoid any possibility of falling prey to government incompetence or exploitation. Both labor and production investors have the interest to avoid exploitation or loss of their investments – i.e. labor prefers to avoid working without compensation and production investors prefer to avoid loss or confiscation of investments into production.

1987; Bates, 1981; North, 1993; Weingast, 1993). By relaxing the restrictive assumption, we are able to consider that citizens behaving rationally and strategically choose to withdraw or withhold investments when economic performance is weak.⁴ Now, labor and production investment are important resources for economic development in open NIC economies such as the Asian NICs, which is, in turn, important to achieving the government's desired social or political goals (see Ames, 1987; Bates, 1981). Consequently, to avert the loss of economic resources and consequent disruption to its social or political goals, the government bargains and makes concessions to its citizens even though it generally prefers not to compromise its breadth, depth, or latitude (Ames, 1987; Bates, 1981).

Thus, the game-theoretic model reveals the following sub-game perfect equilibrium when economic performance is weak: the government bargains to convince citizens to invest their resources of labor or production investment into the economy. By the model, then, the government cannot avoid making concessions to its citizens to dispel concerns of its unwillingness or inability to rectify weak economic performance in open NIC economies in order to encourage resource investment.

To evaluate the model and prediction, annual data are collected from South Korea between 1964 and 1987, Taiwan between 1960 and 1992, and Singapore and Malaysia between 1966 and 1997 for analyses. We use evidence from these Asian NICs during the chosen periods because, more so than other countries and periods, they are most consistently identified as less democratic and their governments able to command or compel advocacy (Freedom House, 1999; World Bank, 1993). If the evidence reveals that even these strong governments in these Asian NICs cannot avoid bargaining and making concessions to motivate investment, the argument likely holds for other open-economy NICs where governments are less strong. We use production investment as the dependent variable because, in general, production investment is not collectivized; in addition, prior to political liberalization in the late 1980s and early 1990s, production investors were depicted as being dominated by the state in these Asian NICs (see Lim, 1998). Thus, the model, strategies, and payoffs developed for production investors here are

4. Briefly, economic performance is reflected by unemployment; this measurement is based on the principle that optimal economic performance is achieved at the non-accelerating inflation rate of unemployment (NAIRU), i.e. that level of unemployment that engenders growth in gross domestic output (GDP) but does not also precipitate inflation. In general, economic performance in an industrializing country is considered strong if it keeps unemployment at about 4 percent; otherwise it is considered to be underperforming, less than optimal, or weak (see, for instance, Ball and Mankiw, 2002; Kennedy, 2000; Krugman, 1996; Lucas, 1996). It should be noted that this 4 percent figure is contingent on development, measurement, and the size of the rural sector in the country.

consistent for other non-collectivized resource-owners such as farmers or non-unionized labor, who are also frequently depicted as passive or having few recourses and, therefore, no bargaining strength.⁵

The results support the model and its prediction of government bargaining across the four Asian NICs – specifically, it reveals that when economic performance is weak, production investment is statistically and positively related to whether the government bargains. This study advances scholarship in three ways: first, by relaxing the restrictive assumption that citizens are naive and do not respond, it reveals that citizens behaving rationally and strategically may be able to convince their governments to bargain, even in less-democratic Asian NICs. Second, it also reveals that governments in less-democratic NICs who need citizens' resources may not be able to avoid bargaining with them. Third, it shows how government may bargain credibly in the absence of formal constraints in these countries. The treatment of citizens as rational and strategic departs from existing studies of Asian NICs, which generally assume that citizens are naive. By relaxing this assumption, this study shows that citizens are not without recourse even in the absence of formal constraints on government.

In the following sections, we derive and discuss the payoffs, decision choices, and decision nodes for the model. We also address how the government may bargain credibly in less-democratic NICs, describe the data and tests, and present and discuss the findings.

2. Bargaining Model in Less-democratic NICs

Studies on the Asian NICs contend that the governments do not bargain with their citizens and credit the economic success of the Asian NICs to the government's ability to ignore or even go against their citizens' preferences for economic performance (Chan, 1993; Evans, 1995; World Bank, 1993). Indeed, these studies suggest that governments behaving strategically should not bargain with their citizens to avoid problems of rent-seeking that lead governments to respond to particularistic rather than general interests.

5. For instance, Bates' (1981) study of the non-collectivized African farmers shows that the model, payoffs and strategies in the non-cooperative game apply to non-collectivized resource-owners such as farmers who are perceived as having no bargaining strength. In particular, through individual decisions to alter their production mix or engage in the black market, farmers cease to cooperate on the governments' agricultural policies. This precipitates chain reactions that ultimately disrupt the governments' desired social, economic, and political order. Other studies from Latin America, Africa, and Eastern Europe report similar findings, such as non-collectivized labor withdrawing their resource of labor quiescence when the government fails to bargain credibly with them (see, for instance, Ames, 1987; Colomer, 1991; Krane, 1983).

However, studies outside of the Asian NICs show that the assumption that citizens are naïve and do not respond to government's failure to consider their preferences to be highly restrictive (Alesina, 1995). For instance, studies document urban-labor protests in Latin America and Africa, rent-seeking by businesses in Latin America, and farmers using the market against governments' agricultural policies in Africa when the government fails to take into account their preferences (Ames, 1987; Bates, 1981; Colomer, 1991; Krane, 1983). That is, citizens behave rationally and strategically even in the face of coercive governments; further, such economic resource withdrawals are self-motivated and self-enforcing when government policies compromise economic performance or the individual's economic welfare (Bates, 1981; Calvert, 1995; North, 1993; Weingast, 1993).⁶ More importantly, non-collectivized resource withdrawals such as farmers changing farm production patterns have ramifications for economic policy success that, in turn, jeopardize the government's desired political and social order (Bates, 1981). Consequently, the government is motivated to bargain with citizens to dissuade such reactions.

The game-theoretic model in this study is informed by these findings in this literature outside of the Asian NICs. To model when and how the government may bargain in less-democratic NICs, we focus on a three-sequence, non-cooperative game between the government and resource-owners. Considering resource-owners as one player supposes that rational and strategic players do not behave differently; as noted previously, this consideration is supported by empirical findings that show that the payoffs and strategies in the non-cooperative game are applicable for non-collectivized labor, farmers, or production investors (Ames, 1987; Bates, 1981; Colomer, 1991; Krane, 1983).⁷ The game is played under perfect information, i.e. the payoffs for each player are known to the other.

6. Such a view conceptualizes institutions as equilibria. Relevant studies focus on self-enforcing equilibrium institutions where adherence to the equilibrium strategy profiles give benefits to people because they behave in a certain combination of ways and are, thus, rational choices (Bates et al., 1998; Calvert, 1995; North, 1993; Weingast, 1993).

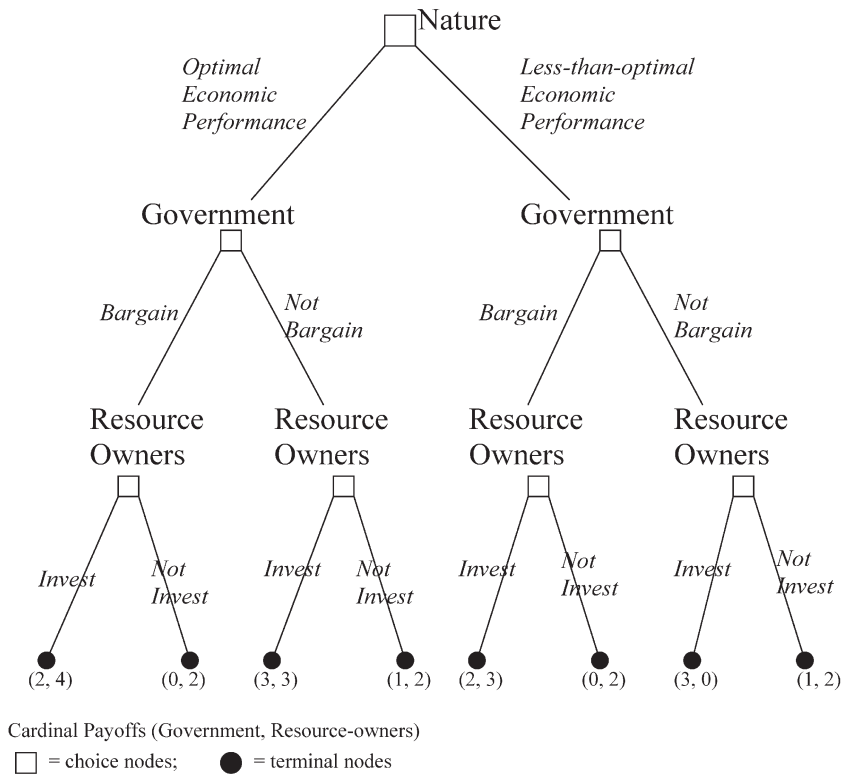
7. See also note 5. Recent reports continue to corroborate that the model, payoffs, and strategies apply to both collectivized and non-collectivized labor. For instance, one needs to look no further than Poland 1980 to be reminded that it is non-collectivized labor that won concessions from the government in Poland through strike activity *before* free labor organization and collectivization were permitted (Public Broadcasting Station, 2004). More recently, China – where independent labor unions and the right to strike have been banned for 20 years – reported an increase in strike activities because of the government's failure to bargain credibly and address unemployment (*AFX News* 2000: 3; *The Australian* 2000). Interestingly, the reports show the Chinese government resorting to tactics reminiscent of former Soviet Bloc countries in an effort to ease the pressure of its increasingly restive workforce – including reducing the working week, increasing the number of vacation days, and legalizing unions and strikes.

In the three-sequence game, Nature moves first between optimal and weak economic conditions. The use of Nature for the first move captures two important considerations: first, as the 1997 Asian financial crisis shows, notwithstanding government effort, open NICs' economies are susceptible to changes in tastes or world economic conditions. Second, it reveals that the need for government bargaining to make concessions to resource-owners holds regardless of whether economic performance is directly attributable to the government's policies.

After Nature moves, the government chooses between bargaining and not bargaining. Bargaining means that the government accommodates resource-owners' central concerns and preferences for strong economic performance. Bargaining, then, is costly because it compromises the government's breadth, depth, or latitude. However, it is more costly to the government if resource-owners withdraw their resources from the economy. Hence, even though the government prefers to encourage production investment without bargaining, it prefers bargaining to the loss of production investment.

Once the government has chosen, citizens as resource-owners of production investment choose to invest or withdraw from the economy. Investing affords the possibility of returns; this possibility is high when the economy is performing optimally but low when the economy is performing less than optimally. Resource-owners also weigh the lack of formal constraints against the government in the less-democratic NICs – when the economy is performing well, the government's unwillingness or even inability to pay attention to economic performance does not pose a threat to resource investments. However, when the economy is weak, the lack of formal constraints against the government allows the government to ignore the performance and continue on its path of action – be it ineptitude, callousness, or inattentiveness – even if these may lead to the loss of resource investments.

Figure 1 displays the game tree that comprises the decision choices, decision nodes, and cardinal payoffs. Resources, whether they are held by the citizens or invested for use by the government, provide a cardinal payoff of 2. For the government, the value of maintaining breadth, depth, and latitude gives a payoff of 1. Bargaining represents the government's effort to reassure citizens that it will accommodate citizens' preferences, feedback, input, and concerns to redress the economic downturn; bargaining, then, costs the government its depth and latitude to give a payoff of 0. However, the bargaining may elicit resources, which provide a payoff of 2, from resource-owners. Resource-owners have the option of investing their resources for returns or withholding them. Holding on to the resources gives a payoff of 2; losing them leads to a payoff of 0. The returns from the investment of resources promise a return of 1; this payoff, in part, captures the promising returns to investment in the NICs when the economies are performing optimally. However, when the economy takes a downturn,



	Optimal Economic Performance	Less-than-optimal Economic Performance
Government's Preferences	Not bargain to elicit investment (3) > bargain to elicit investment (2) > not bargain to elicit withdrawal of investment (1) > bargain to elicit withdrawal of investment (0)	Not bargain to elicit investment (3) > bargain to elicit investment (2) > not bargain to elicit withdrawal of investment (1) > bargain to elicit withdrawal of investment (0)
Economic Actors' Preferences	Invest if government bargains (4) > invest if government does not bargain (3) > withhold or withdraw investment if government bargains (2) ≡ withhold or withdraw investment if government does not bargain (2)	Invest if government bargains (3) > withdraw investment if government does not bargain (2) ≡ withdraw investment if government bargains (2) > invest if government does not bargain (0)

Figure 1. Extended Game Tree For All Economic Conditions

the return is 0. The government's bargaining and accommodation gives resource-owners a payoff of 1 because it gives resource-owners input and influence on the government's policies and the economy.

Based on the cardinal payoffs, citizens' preference ordering may be summarized as follows: invest when the economy performs optimally but withhold or withdraw investment if the government refuses to bargain and the

economy is not performing optimally. Resource-owners' least preferred outcome is to invest when the economy is under-performing and the government does not bargain. The preference ordering for government is summarized as follows. The government prefers not to bargain to convince citizens to invest their resources in the economy but prefers to bargain rather than lose citizens' investment. Its least preferred outcome is bargaining that does not lead to citizens' resource investment.

Figure 2 displays the game form and payoffs associated with the strategic players of government and resource-owners and their choices under optimal economic conditions. The backward induction begins with the last play of the game, that of the resource-owners. There are two Nash-equilibrium strategies for resource-owners: invest their resources when the government bargains, which yields a payoff of 4, and when the government fails to bargain, which gives a payoff of 3. The government knows these choices of resource-owners. If it bargains, it receives a payoff of 2; if it does not bargain,

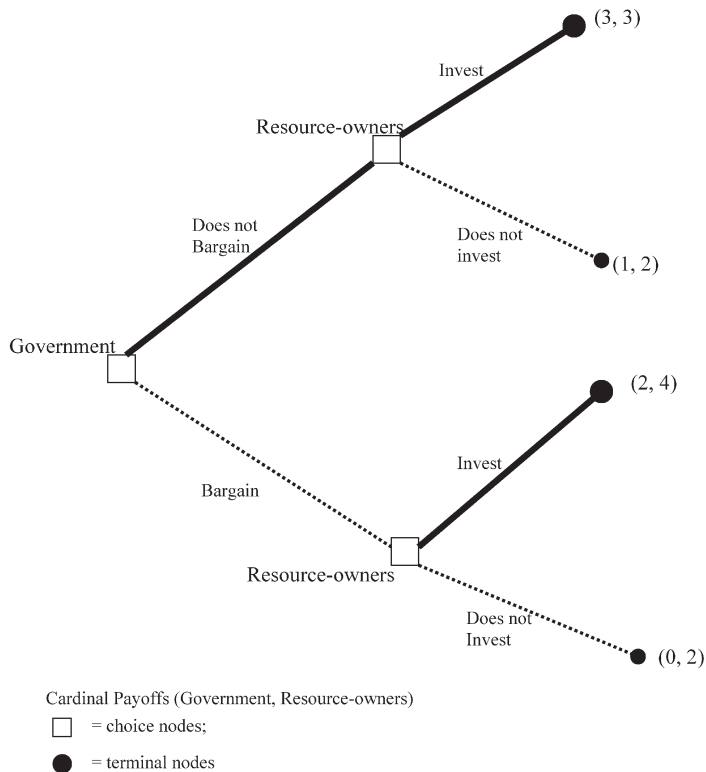


Figure 2. Game Tree (Optimal Economic Performance)

it obtains a payoff of 3. Thus, at the government's choice node, it chooses not to bargain. By backward induction, then, these preferences lead to one sub-game perfect equilibrium under optimal economic performance: the government does not bargain and citizens invest in production.

The game tree and payoffs associated with less-than-optimal economic performance is depicted in Figure 3. As before, resource-owners choose between investing and withholding or withdrawing investment. However, their choices are influenced by two additional considerations: the less-than-optimal economic conditions and the absence of formal constraints on the government. The game reveals two Nash-equilibrium strategies for citizens: invest if the government bargains for a payoff of 3 but withhold or withdraw investments if the government fails to bargain to keep a payoff of 2. The government knows this. If the government bargains, it obtains a payoff of 2, given resource-owners choices; however, if it fails to bargain, it receives a payoff of 1. Based on its own preference ordering, it chooses

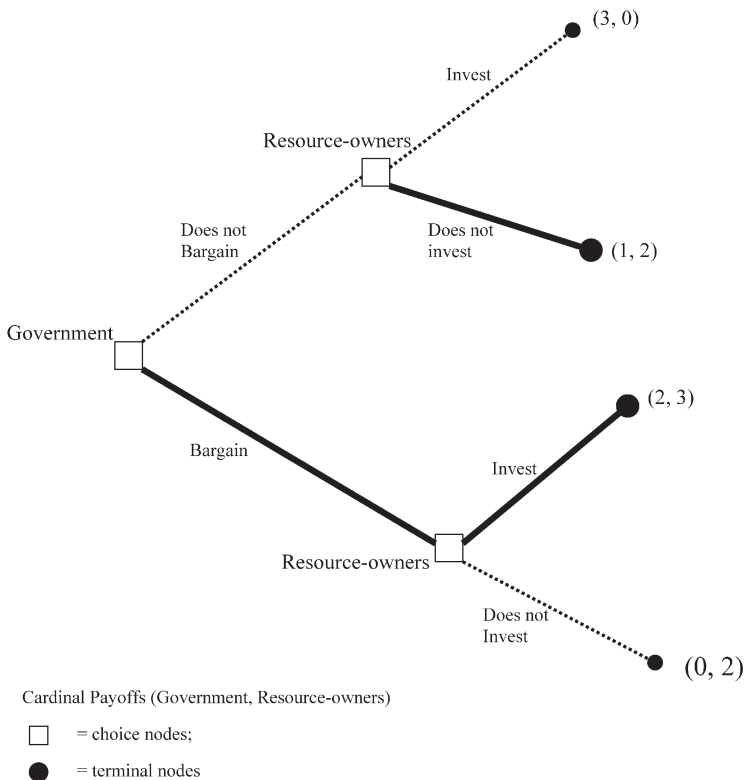


Figure 3. Game Tree (Under-performing Economy)

to bargain. Solving for sub-game perfect equilibrium, when economic conditions are less than optimal, the government bargains and citizens invest in production.

To summarize, when the economy is weak, the game form and cardinal payoffs reveal the following Nash-equilibrium strategies: citizens withdraw their resources if the government does not bargain but invest if the government bargains. By backward induction, these citizens' responses and the government's preferences lead to the following sub-game perfect equilibrium: the government bargains and citizens invest their resources in production investment. The game tree makes clear that the government bargains because of citizens' choices. That is, it makes clear that strategic and rational-acting citizens may persuade the government to bargain for their resource investment. But a more fundamental question remains to be addressed: given the absence of formal constraints on the governments in the less-democratic countries, what makes the government's bargaining credible?

3. Theory and Operationalization of the Government's Credibility

In game-theoretic terms, the government's credibility is established through the basic repeated game which comprises t periods, where $t = 1, 2, 3, \dots, i$, where each period contains four stages, and where the government's discount factor of ω is between 0 and 1 (see also Calvert, 1995, 2002).⁸ The three-stage game presented in Section 2 is embedded in this repeated game. In particular, in the repeated game, after the resource-owners choose to invest, the government plays an additional move where it upholds the accommodations in the second stage or reneges on them. If it upholds the accommodations, it is credible; otherwise, it is not. Resource-owners, then, see what the government does in this stage and can respond to the government's *credibility* when the game repeats, i.e. the next time the economy takes a downturn. Thus, the sub-game perfect equilibrium of the game model is preserved through either grim trigger strategies, where all resource-owners defect when playing with the government who had defected or acted inappropriately, or tit-for-tat strategies, where resource-owners cooperate when the government begins to cooperate, or some combination thereof, for example, tit-for-tat with apologies where the government compensates the resource-owners following its deviation (Calvert, 1995). Punishment of the government's deviation, then, is essential to this sub-game perfect equilibrium, as

8. I thank Randall Calvert for this discussion on repeated game and credibility.

is monitoring for deviation (Bates et al., 1998; Calvert, 1995; Eggertsson, 1990; North, 1993; Ostrom, 1990).⁹

These criteria – *punishment* and *monitoring* – provide the bases for operationalizing the government's credible bargaining. Specifically, the literature on credible commitments reveals that the two procedures in conjunction make bargaining credible, even in the absence of formal constraints. Accordingly, we hold that the two procedures in tandem – *punishment* and *monitoring of government* – make the government's bargaining credible. Specifically, *punishment of government* exacts a toll on government for less-than-optimal economic performance and vests it with an interest in economic performance rather than exploiting the economy. *Monitoring of government* occurs when non-government actors are included in the process of making or evaluating policies. This not only increases private sector participation but also ensures that punishment of government does not merely represent scapegoating or efforts to placate the disaffected. Punishment without monitoring does not suffice to demonstrate government's credibility; likewise, monitoring alone is not sufficient because government is not penalized and, thus, not vested with an interest in economic performance (Bates et al., 1998; Ostrom, 1990). When both punishment and increase in monitoring of government are adopted, the government has bargained credibly to attenuate production disinvestment following less-than-optimal economic conditions.

Neither punishment nor monitoring of government is documented as such in reports. In the tradition of studies of government accountability and survival, we use the following proxies to measure punishment of government: (a) high-ranking government bureaucrats or officials, such as ministers, vice-ministers, or department heads or chairs deemed responsible for economic performance are dismissed, demoted, or replaced; (b) a government agency deemed responsible for economic performance is downsized or eliminated, or relieved of economic responsibilities; or (c) the government makes reparations to those affected by the less-than-optimal economic performance (Ames, 1987; Grofman and Van Roozendall, 1997; Laver and Shepsle, 1998; Ostrom, 1990; Warwick, 1992). Monitoring of government occurs when members not

9. Specifically, the literature contends that commitments are credible when they comprise stiff sanctions to motivate compliance, and monitoring (Bates et al., 1998; Calvert, 1995; Eggertsson, 1990; North, 1993; Ostrom, 1990). For example, Bates et al. (1998: 10) point out that 'a player refrains from straying off the path because he or she anticipates being made worse off . . . through punishment'. Ostrom (1990: 43–5) emphasizes the relevance of monitoring to credibility. We consider punishment to be especially relevant in the less-democratic countries because of the lack of formal vetoes against their governments – in particular, to paraphrase Przeworski and Limongi (1993), it is difficult to conceive of a situation where a government who is not penalized and does not suffer from formal vetoes would, nevertheless, be vested with an interest in economic performance because of monitoring alone.

traditionally represented in the government, such as representatives from academia, business, or labor, are allowed or invited into commissions to oversee, evaluate, review, or make changes to government (Wagle, 2000). The inclusion of the non-governmental members adds transparency to the oversight, evaluation, review, or reform and integrity to the monitoring.

To illustrate how the evidence is coded, consider the example of Singapore in 1985. Economic recession hit Singapore in 1985. Reports show that, almost immediately, the Finance Minister was replaced with a former private sector leader.¹⁰ Further evidence of the government's bargaining is evident in the divestment of government-owned enterprises to allow the private sector to participate more actively in the economy. Other measures adopted that year include *increasing private sector participation* to safeguard 'what Singaporeans have achieved' (Wee Kim-wee, 1985). To that end, a committee of 12 was established to re-evaluate and revise the government's 10-year Economic Development Plan for the 1980s. The 12-member committee comprised six business representatives and six members from the government and was assisted further by eight sub-committees, which also comprised a mix of public and private sector representatives. As a business editorial pointed out, 'it is unusual for the private sector to be given the chance to help design the economic blueprint for the future' (Singapore Chamber of Commerce, 1985). Members of Parliament and 'prominent members of the public' also formed feedback units in 1985 to collect feedback and propose revisions on existing or impending government policies (Singapore Chamber of Commerce, 1985). Based on the evidence, the Singapore government's efforts are coded as credible bargaining in 1985. Other examples of coding are presented in Table 1.

To summarize, the government's credibility is established through the basic repeated game so that the absence of formal constraints on government in the less-democratic NICs does not preclude the government from bargaining credibly or resource-owners from responding to that credibility. In terms of measurement, the government's credible bargaining is operationalized as comprising both punishment and increase in monitoring of the government to demonstrate its effort and will to redress weak economic conditions. The next section details how the other variables in the model are operationalized for tests.

10. Interestingly, the former Finance Minister had proclaimed that there would be no turning back on the Singapore government's policy to become high capital and brain-intensive (Singapore Chamber of Commerce and Industry's *Investor's Guide* [1960–63, 1970–90] and *Economic Bulletin* [1985–86]). Also of interest is this: the former Finance Minister recanted his stance in late December 1985. He acknowledged that 'we will have to modify a number of cherished economic policies which have been stoutly defended on various occasions by members of the Government, including, I should add, myself . . . We should not hesitate to make changes in policy when it is clear that changes are necessary' (Singapore Chamber of Commerce, 1986).

4. Operationalization of the Variables of Interest

The model predicts that governments bargain in less-democratic NICs to avert the potential loss of resource-investments. To evaluate the prediction, annual production investment in four Asian NICs are analyzed through regressions: South Korea from 1964 to 1986, Taiwan from 1960 to 1992, and Singapore and Malaysia from 1966 to 1998. The periods and countries are chosen because studies identify them as less-democratic NICs with strong governments and weak interest groups (Freedom House, 1999; World Bank, 1993). The data are obtained through international and national agencies. Economic information, such as unemployment, annual growths in real per capita GDP, and real interest rates, are obtained directly or calculated from figures published by international sources such as the *World Tables*, *Yearbook of Labor Statistics* (International Labor Organization [1960–95] and the *International Financial Statistics Yearbook* [International Monetary Fund, 1995, 1996]). We use change in private investment in production to capture production investment; these are calculated from figures released by the departments of statistics in the respective countries. Data from which to code the governments' credible bargaining are obtained through the following publications: (a) annual state of country reports, (b) annual budgets, (c) annual ministry reports, and (d) business publications. These publications vary primarily in the breadth and depth of coverage of government decisions or policies and, thus, provide useful verification of demotions, dismissals, or discharges within and increases in the monitoring of government.

We follow the conventions in the literature and use annual measures to evaluate the model and its predictions (see, for instance, Pacek and Radcliff, 1995; Powell and Whitten, 1993).¹¹ To ensure that the timing and effect of government's responses on resource-owners are correctly imputed in the annual measures, we code evidence of government bargaining in the last quarter of year t , i.e. from October until December, as bargaining in year $t + 1$. This coding considers that the responses of resource-owners during year t primarily reflect reactions to government actions during the course

11. Quarterly data may be useful for this exercise but, unfortunately, are not consistently, if at all, available for the NICs. For example, quarterly data for most economic indicators for South Korea and Singapore were not computed until the mid-1970s and not available for Malaysia until the 1980s. Several remain unavailable to this day, including seasonally adjusted quarterly data on investment, the key dependent variable in this study. See Alesina et al. (1997) and Chowdhury (1993) for a discussion of the problem of quarterly data availability in industrializing countries and even some industrialized ones. Notwithstanding the lack of quarterly data, Section 4 notes that the timing and sequence of the government's response and resource-owners' reactions may be taken into account in the coding and operationalization of the variables.

Table 1. Examples from South Korea, Taiwan, Singapore and Malaysia to illustrate Credible Apology Coding

Year/ Country	Reports ^a	Punishment? ^b	Reports ^c	Monitoring? ^d	Credible bargain? ^e
1964/South Korea	<i>Prime Minister</i> replaced; Pledge by government to deal with chronic corruption – to that effect, <i>576 public officials</i> , including <i>several vice-Ministers</i> , referred to disciplinary committee on charges of bribery and <i>Finance Minister resigns</i> ; Move to <i>denationalize</i> public corporate enterprises – 16 government-owned enterprises, including five commercial banks among targets for denationalization. ^f	Yes	Administrative Improvement research commission, <i>comprising opposition leaders as well as academia</i> , set up to conduct research and <i>recommend reforms</i> on government organizations; <i>Impeachment bill</i> passed by National Assembly – high ranking officials, including President, liable to be impeached; President attempts to pass Press Ethics Law but opposition thwarts efforts to set up Ethics Commission – government rescinds law	Yes	Yes
1986/South Korea	Major cabinet reshuffle – <i>five key economic positions</i> , including <i>Finance Minister and head of Economic Planning Board replaced</i> .	Yes	Creation of a special National Assembly Committee to discuss constitution; President Chun presents three principles on constitutional revision; Government appoints 10 vice-minister level positions.	No	No
1979/ Singapore	New Ministry of Trade and Industry; Wage restructured and increased; Skills Development Fund imposed.	No	New Ministry of Trade and Industry; Economic Development Unit to assist upgrade of local manufacturers.	No	No
1973/Taiwan	Premier Chiang Ching-kuo promulgates 10-point administration reform plan to be implemented immediately, including: <i>tighter control</i> of foreign travel by	Yes	<i>Supplementary elections</i> held on 23 December 1972 for 53 National Assembly delegates, 36 legislators, and 10 Control Yuan members;	Yes	Yes

	government employees; <i>austerity</i> at weddings and funerals for government officials; <i>mete out severe punishment</i> for corruption; <i>expel</i> wrongdoers; Economic Planning Council set up to <i>replace</i> Council for International Economic Cooperation and Development.		National reconstruction seminar with 160 scholars meeting to <i>recommend plans</i> for industrial research; development of heavy industry; investment in light industry; set up of sound accounting system for banking and monetary operations.		
1970/ Malaysia	Tariff Advisory Board <i>dissolved</i> at Capital Investment Council's recommendation; Promise to streamline administrative procedures, personnel, and organizational structures in government following complaints of government inefficiency; Development Administrative Unit in Prime Minister's office <i>reorganized for administrative reform</i> .	Yes	Capital Investment Council set up with <i>private sector advisory panel</i> ; National Goodwill Council set up to provide continuous <i>forum between public and private sector</i> on government policies; National Consultative Council <i>with non-government representatives and opposition leaders</i> set up to consider economic policies, possibly coexist with Parliament.	Yes	Yes
1993/ Malaysia	Corporate tax reduced; Individual tax reduced; Development tax reduced; Increase in contribution rates to Employment Provident Fund (the equivalent of social security).	No	Human Resource Fund set up to encourage training; Shipping Venture Facility set up with RM 300 million to provide long-term financing to shipping industry.	No	No

^a, ^c Emphasis added in italics.

^b Punishment is coded as 'yes' based in large part on reports (italicized) of dismissal or demotion of high-ranking appointed officials or discharge or reduction of the portfolio of government agencies.

^d Monitoring is coded as 'yes' if reports show monitoring of the government by non-government representatives is increased (italicized).

^e Credible bargaining is coded as 'yes' if both punishment and monitoring are carried out.

of year t rather than at the last quarter of the year. Adopting this coding scheme changes the coding for two observations in South Korea (from 1970 to 1971) and four in Taiwan (from 1969 to 1970 and 1972 to 1973) but does not affect the results statistically or substantively, i.e. the results are robust to alternative coding schemes.¹²

4.1. The Dependent Variables: Production Investment

Change in production investment is captured by percentage change in real (constant) private investment in production from the previous year. The 1997–98 financial crisis in East Asia reveals that even investments, conventionally considered less adaptive, can and do change rapidly in open-economy NICs. To show that change in private investments in production does not merely reflect changes due to an expanding or shrinking domestic and world economy, control variables for the domestic and world economy are also used. These are detailed in Section 4.4.

4.2. Independent Variable: Government's Credible Bargaining

To recap the discussion in Section 3, theory and the literature underscore that monitoring and punishment are essential to credibility (Bates et al., 1998; Calvert, 1995; Eggertsson, 1990; North, 1993; Ostrom, 1990).¹³ Accordingly, the government's credible bargaining is operationalized as comprising punishment and monitoring of the government. Punishment of government occurs when high-ranking government bureaucrats are dismissed, demoted, or replaced or high-profile offices downsized eliminated, or relieved of economic responsibilities, or the government makes reparations to those

12. The reason why the coding does not affect more cases is because, in general, the government's credible bargaining rests on more than one instance each of punishment and monitoring of government, i.e. there are few instances where the government waits until the final quarter of the year to bargain.

13. Anecdotal evidence bears out the argument that both punishment and monitoring are essential to credibility. Witness the recent case in the USA regarding the intelligence community. Specifically, the US September 11 Commission created to investigate the government's response to the 2001 attacks led to the resignation of the Central Intelligence Agency (CIA) director George Tenet and an effort to create a national director of intelligence who would oversee the government's 15 intelligence agencies (*The New York Times*, 10 August 2004). Indeed, when President Bush endorsed the creation of the said new national director of intelligence but without budgetary powers or the right to hire and fire, analysts decried the position as superficial. See also note 14. Table 1 elaborates further the relevance of punishment. For instance, a reading of the increases in monitoring in 1964 may lead one to suppose that the changes are mere window-dressing. However, the concomitant component of punishment signals that government is and will be responding to the monitoring.

affected by the less-than-optimal economic performance. Monitoring of government occurs when non-government representatives from academia, business, or labor compose commissions to oversee, evaluate, review, or make changes to the government. The government's credible bargaining is captured through a dichotomous variable. When both punishment and monitoring of the government occur, government is coded as bargaining credibly; if either or both are absent, government is coded as not bargaining.¹⁴

The effect of the government's credible bargaining on production investment likely varies with the magnitude of economic performance. To capture that variability, an interaction variable of government bargaining with unemployment is used. This interaction variable calibrates the effect of the government's bargaining with economic performance as measured by unemployment. The significance of using unemployment is discussed next.

4.3. Independent Variable: Economic Performance of Transitioning Economies

Economies in transition from industrializing to industrialized states may experience higher and more variable levels of growth than found in mature economies (Kormendi and Meguire, 1985). To illustrate, consider that the real GDP growth for Singapore, Taiwan, and South Korea for 1997 were 9.0, 6.8, and 5.5 percent respectively, despite the onset of the financial crisis in East Asia (Department of Statistics (Singapore), 1999; *Korea Statistical Database*, 1999). In contrast, the USA, which experienced a year of strong economic performance in 1997, saw a growth rate in real GDP of 3.9 percent (Bureau of Economic Analysis, 1998). Thus, to capture economic conditions in the NICs appropriately, two indicators are used: the annual growth in real per capita GDP and the unemployment rate.¹⁵

The unemployment rate is adopted because human capital, in general, comprises one of the primary assets in many of these NICs. Contemporary

14. We note here that there are no cases in South Korea, Taiwan, and Malaysia where there was increased monitoring but no punishment of the government. In Singapore, there were three instances of increased monitoring without punishment. Recoding the government's credible bargaining in these instances so that monitoring is sufficient for the government's credibility led to significantly different and deteriorated results. These findings corroborate the theory that both punishment and monitoring are essential to establishing credibility.

15. Following the convention in the literature, inflation (i.e. percentage change in consumer price index) was also used as a variable to reflect economic conditions in preliminary models. However, the effects of inflation were not statistically significant and adding the inflation variable depressed the explanatory value of the models. Given the small numbers and the need for parsimony, the variable is dropped from the models here.

growth theorists have also pointed out the utility of human capital as an endogenous factor to explain economic growth (Barro, 1990; King and Rebelo, 1990; Romer, 1990).¹⁶ The use or under-use of human capital, then, is a strong indicator of whether the economy is performing well. Following the convention in the literature, the absolute unemployment rate is used because of the ease of its interpretation and since the use of change variables do not yield additional explanatory power (Anderson and Ishii, 1997; Powell and Whitten, 1993).¹⁷

4.4. Other Independent Control Variables

Three additional independent variables that capture the effects of the expanding or shrinking domestic and world markets are used to control for the effects of economic conditions; they ensure that the effects of the political variables do not reflect any biases from missing economic variables. The additional economic variables used are: the annual change in real interest rates in the domestic economy, the annual change in real interest rates in the USA, and the annual growth in real GDP of the USA. The annual change in real interest rates and growth in real GDP of the USA are used because of US influence on the world economy. Also, the USA is one of the largest trading partners for the Asian NICs.

5. Empirical Test and Results

The model presented in Section 2 reveals that government bargaining for citizens' resource-investment is a sub-game perfect equilibrium when the economy is under-performing. This section evaluates the prediction with a linear regression model on percentage change in private investment. The results support the model if the regression results show that the government's credible bargaining increases investment when the economy is underperforming, i.e. the net effect of the two variables measuring government bargaining is positive on investment when economic performance is less than optimal.

16. The contemporary growth perspective departs from the neoclassical assertion that growth is the result of exogenous technological advances that, in the presence of international capital markets, leads to a convergence in steady state growth rates.

17. An example makes clear why change in unemployment offers little explanatory power. Consider changes in unemployment from 10 to 6 percent and from 8 to 4 percent. In both instances, the change is 4 percent and statistically identical. However, an economy with 6 percent unemployment rate is substantively different and perceptibly worse than one with 4 percent unemployment. Thus, the level of unemployment yields more information than the change in unemployment.

We investigated the need to add a lagged dependent variable to the model. Theoretically, we do not expect change in production investment to be influenced by previous changes – decisions regarding production investment are not incremental and do not depend upon former changes. Empirical tests corroborate this: the lagged dependent variable is not statistically significant across all the tests.¹⁸ It is, thus, omitted in the interest of parsimony and robustness.

We also considered the relevance of using lagged government bargaining as an explanatory variable. Theoretically, we expect that governments of NICs with open economies cannot hold off bargaining until the next year, especially if they need economic resources from resource-owners, because resource-owners are not likely to wait a year for evidence of the government's credibility to invest or withdraw their resources. Empirical tests confirm this; consequently, the variable is not adopted.

Table 2 reports the results of the regression analyses. In general, the results support the model and its predictions – the government's credible bargaining statistically improves investment across all four Asian NICs when their economies are underperforming. Column 1 reports the results of the regression for South Korea, column 2 for Taiwan, and columns 3 and 4 for Singapore and Malaysia respectively.

The results for South Korea show that economic variables of real growth in GDP in the USA and the unemployment level in South Korea are statistically relevant in explaining changes in production investment in South Korea. Specifically, increases in real GDP growth in the USA increase production investment, which may reflect the influence of the US economy on the South Korean economy. Decrease in unemployment increases production investment in South Korea; this result lends support to the interpretation that citizens' resources are put into production investment. The results also show that government's credible bargaining is statistically significant in explaining production investment. The effect of government's credible bargaining is measured by two variables, the dichotomous variable capturing whether government bargained, and the interaction variable that indexed government's bargaining to the economy. The effect of government's credible bargaining, holding other variables constant, is $[-157.4 + (41.44 \times \text{unemployment})]$. This means that government's credible bargaining

18. We evaluated the empirical relevance of a lagged dependent variable through three tests: Granger causality, regression, and robustness tests. Granger causality tests report no statistically significant lagged dependent variable effects. This was corroborated by regression analyses that incorporated a lagged dependent variable; the variable was not statistically significant in results across the three countries but led to inflated standard errors and reduced adjusted explained variance for the regression. These results indicate that the lagged dependent variable is statistically irrelevant. Robustness tests, reported in detail in footnote 21, also justify the omission.

Table 2. Linear Regressions of Percentage Change in Investment in Production for South Korea, Taiwan, Singapore, and Malaysia

Dependent variable	Percentage change in production investment (INVEST)			
	South Korea Column 1 (standard errors)	Taiwan Column 2 (standard errors)	Singapore Column 1 (standard errors)	Malaysia Column 2 (standard errors)
Real growth in per capita GDP in domestic economy	-2.56 (2.91)	0.51 (3.14)	3.62* (1.73)	0.32 (0.33)
Change in real interest rates in the USA	-5.29 (7.92)	1.26 (6.34)	6.97** (2.57)	-0.23 (1.05)
Change in real interest rates in the domestic economy	1.01 (2.05)	-0.69 (0.79)	-4.22*** (1.21)	-0.29 (0.44)
Real growth in GDP in the USA	7.87* (4.38)	-0.11 (4.44)	-2.45 (2.15)	-0.11 (0.72)
Unemployment	-39.74** (13.06)	-2.35 (11.34)	0.41 (7.29)	0.37 (0.88)
Government bargaining	-157.39 (90.35)	-94.61 (62.46)	-95.23** (38.58)	-29.18* (14.85)
Government bargaining* unemployment	41.44** (19.05)	62.36* (30.23)	20.10* (10.00)	4.75** (2.27)
Intercept	170.90** (64.68)	-3.99 (28.90)	-0.82 (23.08)	-5.02 (5.80)
<i>N</i>	20	26	24	27
<i>R</i> ²	0.53	0.33	0.69	0.29
Adjusted <i>R</i> ²	0.26	0.07	0.55	0.03
F-statistic ^a	1.93	1.28	5.0***	1.10
DW ^b	1.8	1.7	2.2	2.1

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

^a The low F-statistic reflects the problem of correlation between the variables of real growth in the domestic economy, real domestic interest rates, real growth in the US economy, and real interest rates in the USA. Given that collinearity is a data problem rather than a theoretical one (see, for example, Kennedy 1996), in the interest of replicability, the same model is retained across all the countries. We note here the F-statistics (probability) for the countries when one or more of the collinear variables are dropped from the model: South Korea, 2.27 (0.1); Taiwan, 2.56 (0.07), Singapore, 5.53 (0.003); Malaysia, 2.43 (0.1).

We note, too, that the parameter estimates for the government's credible bargaining are stable and remain statistically significant across the models.

^b See discussion in footnote 21 regarding tests of robustness for the regressions.

increases production investment when unemployment rises above 3.8 percent in South Korea, holding all other variables constant. Interestingly, this 3.8 percent unemployment threshold is close to the 4 percent target that the South Korea government set in the 1960s, 1970s, and 1980s to reflect optimal economic performance (Yonhap News Agency, 1971, 1993; Korean Ministry of Labor Report, 1998). A joint-hypothesis test of the two variables capturing government's credible bargaining has a statistical significance of 0.07 to show that both variables are highly significant in explaining production investment.¹⁹ The results for South Korea, then, support the model's prediction that government bargaining when economic performance is weak increases production investment.

Taiwan's results provide further support for the game-theoretic model. Only the variables capturing the government's credible bargaining are statistically significant in explaining percentage change in production investment in Taiwan. Indeed, a joint-hypothesis test of the two variables report a statistical probability of 0.043 that the two variables are indistinguishable from zero in explaining production investment. The government's credible bargaining increases production investment when unemployment increases above 1.5 percent; this is the lowest threshold distinguishing optimal versus less-than-optimal economic conditions of the four Asian NICs. It is noteworthy that Taiwan has had a median unemployment rate of 1.8 percent since 1960; in fact, unemployment exceeded 4 percent only between 1960 and 1964. The official unemployment target is set at 2.5 percent (Taiwan Ministry of Economic Affairs, 1998).

The results for Singapore also support the model's prediction. The economic variables of real per capita GDP growth in Singapore, change in real interest rates in the USA, and change in real interest rates in Singapore are all statistically significant predictors of percentage change in production investment in Singapore. The direction and effect of the economic variables as reported by the regression analysis are consistent with macroeconomic theory, i.e. production investment rises with the following: increases in real per capita GDP growth in Singapore, increases in real interest rates in the USA, and decreases in real interest rates in Singapore. The government's credible bargaining is also statistically significant in explaining change in production investment. The net effect of the Singapore government's bargaining is: $[-95.2 + (20.1 * \text{unemployment})]$. Thus, if unemployment rises above 4.7 percent, the Singapore government's credible bargaining

19. The F-statistic represents the joint hypothesis test using the residual sum of squares of a constrained model (in this case, the baseline model) and that of an unconstrained model (the political-economic model) to assess if the latter adds significant statistical explanatory value. See Greene (1997: 337–8) and Kennedy (1996: 66–7).

increases production investment. As with the South Korean cases, the 4.7 percent threshold is close to the 4 percent target cited by the Singapore government as the optimal unemployment rate (Singapore Ministry of Labor, 1974, 1976; Singapore Ministry of Finance, 1975, 1985).

The model is also supported by the Malaysian cases. Confounding problems with production investment led to the substitution of increase/decrease in the real (constant) stock values as the dependent variable.²⁰ Column 4 shows that the economic variables are not predictors for the increase/decrease in the stock values in Malaysia but both variables capturing the government's credible bargaining are significant predictors (probability of 0.06 and 0.05 respectively). By the regression analysis, the net effect of the government's credible bargaining is $[-29.18 + (4.75 \cdot \text{UNEMP})]$. This means that, holding all other variables constant, the government's credible bargaining increases stock values when unemployment rises above 6 percent. The 6 percent unemployment threshold in Malaysia is higher than the other NICs in this study and may reflect the larger rural economy in Malaysia where farming families offer potential buffers or relief against unemployment.

The results in Table 2 show that private investment in production increases above the level suggested by economic considerations alone when the governments bargain credibly following less-than-optimal economic performance in the economies. The results are consistent across the countries and holds true across the different economies, including Malaysia's larger rural economy. Diagnostic tests show that these results are robust.²¹

6. Discussion

We set out to uncover whether the absence of formal constraints in the less-democratic NICs means that the governments do not bargain with their citizens. Studies of the Asian NICs argue that the governments do not

20. In the case of Malaysia, we use real (constant) increase/decrease in stock value reported in the *International Historical Statistics* (current values reported in the *International Financial Statistics Yearbook* [International Monetary Fund, 1995, 1996]) because of confounding data problems. The investment figures reported by the Malaysian government are confounded in two ways. First, until 1983, the numbers included investment by quasi-public agencies, which overestimates private sector activity and investments; second, the figures include investments in petroleum and gas production, which fails to take into account the non-rejuvenating nature of huge initial oil and petroleum investments. The increase/decrease in stocks measure is a cleaner indicator because it does not reflect these problems.

21. Specifically, we explored possible problems of outliers, serial correlation, and endogeneity. South Korea, Taiwan, and Singapore have cases where changes in investment exceed 100 percent in a year, such as in 1973, wherein the change in private production investment probably reflected

and, perhaps, should not bargain with their citizens in order to motivate their cooperation on economic policies. However, studies outside of the Asian NICs contend that strong governments who do not bargain with their citizens have no incentive to work on behalf of the citizens and threaten rather than encourage citizens to invest their resources into the economy (Bates, 1981; North, 1993; Weingast, 1993).

This article develops a game-theoretic model to answer the question of whether governments bargain in the less-democratic NICs. We relaxed the restrictive assumption that citizens are naive to develop a game form that considers how citizens behaving strategically and rationally would act. The game tree shows that withdrawing resources from production is a Nash equilibrium strategy for citizens when economic conditions are less than optimal and the government refuses to bargain. By backward induction, it reveals that the sub-game perfect equilibrium outcome when economic conditions are less than optimal is this: the government bargains so that citizens will invest in the economy. This sub-game perfect equilibrium outcome is preserved by citizens' ability to observe and respond to the government's credibility in repeated plays. Thus, the model reveals that governments in the less-democratic NICs bargain credibly for its citizens' resource investments. The model also makes clear that the government's bargaining is motivated by citizens' choices.

The model and its prediction of when and why the government bargains is evaluated through regression analysis using data from four Asian NICs – South Korea between 1964 and 1987, Taiwan from 1960 to 1992, and Singapore and Malaysia from 1966 to 1997. These countries are chosen because,

a surge as a result of funds from the oil producing countries. These circumstances are unlikely to be repeated. Regressions that include the outliers had higher adjusted R^2 and more statistically significant coefficients. However, in the interest of robust findings, these cases are dropped to avoid their outlier effects on the regression results. Tests for serial correlation suggest that it does not pose a problem for the results here. The Durbin–Watson (DW) statistic for South Korea's cases is 1.8, which falls in the intermediate range for 20 cases and seven regressors. The DW of 1.7 for Taiwan's cases also falls in the intermediate range (26 cases). Singapore's and Malaysia's cases are at or exceed the upper bound (2.2 for 24 cases and 2.15 for 27 cases respectively). Iterative correction for potential autocorrelation for South Korea and Taiwan did not change the results significantly – the statistically significant variables retained their significance under the corrections. The variables in the model were also tested for weak exogeneity as well as for Granger causality (Granato and Smith, 1994). Specifically, Granato and Smith (1994) point to sources that show that a variable is strongly exogenous if it is both weakly exogenous and is not 'Granger caused' by the endogenous variable; further, in linear models, this condition of strong exogeneity is equivalent to the Cowles definition of strict exogeneity (25–6). Parameter constancy tests for weak exogeneity show that the variables are weakly exogenous to the dependent; further, the dependent variables do not 'Granger cause' the independent variables. These tests, in conjunction, support a finding of strict exogeneity of variables.

more so than other countries, scholars contend that these governments do not bargain and are able to secure their citizens' resource investments through this failure to bargain.

The regression results support the model and predictions across the four Asian NICs and across time. Specifically, when economic performance is weak, production investment increased across all the countries when the government bargained. Interestingly, the thresholds distinguishing optimal from less-than-optimal economic conditions obtained from the regression analyses are close to the official non-accelerating inflation rate of unemployment (NAIRU) targets set by the governments in the Asian NICs.

Through game-theoretic and statistical analyses, the study here shows that governments in open-economy NICs cannot avoid bargaining with their citizens for economic resources when economic conditions are less than optimal. This finding contradicts studies of the Asian NICs that show that the governments do not bargain. The results also show how citizens may use the withdrawal of resources to entice the government to bargain. And, drawing on the credible commitments literature, we show how a government may bargain credibly despite the absence of formal constraints. These results potentially expand the empirical bases for theories on bargaining.

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