

**THE ECONOMIC IMPLICATIONS OF A NORTH KOREAN
NUCLEAR BREAKOUT**

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EXECUTIVE SUMMARY

This paper analyzes the economic implications that a North Korean nuclear breakout would have on Northeast Asia.

MAIN ARGUMENT

A North Korean nuclear test would likely have negative though non-catastrophic economic impact on the region:

- *South Korea* would likely suffer from capital flight, consequent declines in asset prices and investment, and possibly a minor budgetary loss associated with existing investment guarantees to companies operating in the North.
- *Japan's* economy would also suffer from capital flight, asset price declines, and a reduction in investment. The true consequences, however, will be political: a nuclear test might strengthen Japanese attitudes towards re-militarization.
- *China* will be the least directly economically impacted, though significant indirect effects could be felt if China's policy toward North Korea became entangled in trade policy tensions with the United States, the European Union, and Japan.
- *North Korea.* A nuclear test would lead to a temporary economic shock, but concerns about North Korean political stability would keep South Korea and China engaged.

POLICY IMPLICATIONS

- North Korean nuclear proliferation activities could have large negative economic spillovers on its neighbors in Northeast Asia.
- The negative impact a nuclear breakout would have on the region underscores the importance of international cooperation to solve the North Korean nuclear problem and to deter Pyongyang from carrying out provocative policies.
- Governments with interests in Northeast Asia should prepare cooperative measures to lessen the economic and political impacts of a North Korean nuclear breakout.

Introduction

This paper examines the economic implications for Northeast Asia of a North Korean nuclear breakout. One normally thinks of the cross-border effects of an event in one country being transmitted to others via trade and financial-market linkages. The simplest route is through direct trade links: An adverse shock to one economy, for example, can be transmitted to others through a reduction in the volume of imports and exports, depressing activity in its trade partners if the trade forgone has no ready substitutes. Trade shocks can also be propagated through exchange rates: An adverse event in one country could cause a depreciation in its exchange rate, conveying competitive advantage in traded-good markets over its rivals, as occurred during the 1997 Asian financial crisis (Noland et al. 1998). No direct trade linkages are necessary: The real effects could be felt in other countries purely through an erosion of competitiveness in third-country markets.

However, it has become apparent in recent years that financial-market links may constitute a more rapid and important transmission channel; financial markets react more quickly to events than do goods markets, and financial-market crises can cause large declines in output, as South Korea, for example, painfully learned in 1997–98. Cross-border capital-market links can take a variety of forms; analogous to the trade case, the most direct way financial-market events in one country can impact outcomes in another is by directly affecting the volume and composition of its capital flows, as for example occurred during the same Asian crisis period when Japanese banks, reacting to financial distress at home, cut lending to other Asian economies.

Equally important, though, is the possibility of cross-border contagion. In this case, investors may abruptly alter their assessment of financial-market risk in one country based on its perceived similarity to another. In this case, there is no need for either extensive direct financial-market links as in the case of Japanese bank lending to the rest of Asia or trade competition as in the competitive devaluation case. Herd behavior by imperfectly informed investors, foreign or domestic, can exacerbate this phenomenon. The 1997 Asian experience again provides an illustration: A financial crisis in Thailand gave rise to a broader reevaluation by investors of the risks of investment in Asia, ultimately leading to withdrawal of capital from those economies and precipitous fall in

asset prices, which contributed to depressing economic activity throughout the region. Direct financial links are not required; all that is necessary is that an economy be regarded as similar to the problem case by investors to generate heightened risk assessments, assets price declines, and capital flight.

Viewed from the standpoint of its trade partners, North Korea's direct trade links with the region are so slight that it is hard to imagine a trade shock emanating from North Korea having much of an impact on its partners at the national level, though particular firms or localities might be adversely affected. (The converse—that trade links are too minor to significantly impact North Korea—does not hold, however, as will be discussed below.) Yet despite the weak trade links between North Korea and its neighbors, it will be argued that events in North Korea could have significant effects on the economies of the region via financial markets.

For heuristic purposes, these arguments are developed through two scenarios: a mild shock scenario in which North Korea tests a nuclear device and a major shock scenario in which it exports fissile material or a nuclear weapon. Uncertainty surrounding either event is assumed away to focus on the effects of these actions (i.e., there is no dispute as to whether the North actually tested or actually sold nuclear material—it is acknowledged by all relevant parties). Nor does the paper make any claim as to the likelihood of either eventuality; they are simply proffered as a narrative mechanism to elucidate some of the channels through which North Korea's behavior could reverberate through the economies of South Korea, Japan, and China.

A Nuclear Test Scenario

South Korea

South Korea is the neighboring economy most exposed to a North Korean nuclear test. This vulnerability stems from its geographic proximity to, and political rivalry with, the North, in combination with the South's relative financial-market openness and recent history of financial crisis. The relatively intimate links to North Korea mean that financial-market participants are likely to strongly condition assessments of risk in South Korea with developments in the North, while the degree of financial-market openness

means that market participants have both the scope and an incentive to act on heightened assessments of risk.

During the earlier nuclear crisis of 1993–94, the government intervened through state-dominated financial institutions to support the markets; indeed, the stock market actually rose during the crisis. However, this was in the context of a financial system that embodied pervasive controls on cross-border capital controls, state domination of financial institutions, and scant foreign participation in South Korean financial markets (Noland 2005a).

All of these conditions have changed over the past decade. Among the legacies of the 1997–98 financial crisis was the elimination of capital controls that inhibited capital flight by domestic residents during the first nuclear crisis. Today South Korean residents have greater opportunities to move their funds abroad.

Similarly, the use by South Korean financial firms of off-balance sheet transactions and financial derivatives, which did not exist during the earlier nuclear crisis and which were made possible by wide-ranging financial-market liberalization that followed the financial crisis of 1997–98, impairs the state's ability to stage-manage financial-market outcomes as it could a decade ago. South Korea is now the world's busiest market for equity derivatives, with turnover exceeding that in the United States, with individual investors accounting for a large share of trading.¹ The potential for an uncontrollable panic would appear to be much larger than during the first nuclear crisis.

Finally, financial-market liberalization gave rise to a vastly expanded role for foreigners in South Korea's financial markets. Today foreign investors own roughly 40 percent of the shares on South Korea's stock exchanges. The expanded role of foreign participants and the increasingly complex nature of the financial transactions mean that the market today is far less susceptible to political intervention than it was a decade ago.

Moreover, the popular image of capital flight occurring when foreigners flee for the exits is belied by historical experience the world over—almost invariably it is the better-informed locals who are out the door first. In the case of South Korea, the bulk of domestic savings are controlled by older South Koreans whose views on the North are distinctly more skeptical than their children's. Domestic residents were net sellers of

¹ Anna Fifield, "Korea becomes king of derivatives hill," *Financial Times*, 4 January 2006.

equities in the period immediately preceding the inauguration of President Roh Moo-hyun, who scored poorly with older and more conservative voters—the predominant owners of South Korea’s liquid capital.

Suppose there were an acknowledged nuclear weapons test in the North. It is reasonable to expect that in the short run, at least, sovereign debt would be downgraded and both foreign and domestic investors would flee won-denominated assets. However, unlike the situation during the first nuclear crisis, or during the subsequent financial crisis, the government of South Korea possesses huge official reserves—over \$200 billion at year-end 2005—that it could use to defend the won or prop up local financial markets. And while the 1997–98 financial crisis resulted in substantial opening of the capital account, the safeguard provisions of the Foreign Exchange Transaction Act permit the government to suspend foreign exchange transactions for up to six months in the face of “a critical situation such as a natural disaster, war, drastic change in international or domestic economic conditions or any similar situation” and impose taxes on capital account transactions, and/or require prior approval for such transactions “when the national economy’s balance of payments and international finance face serious difficulty or when the cross-border movements of capital bring about serious obstacles to the execution of economic policies.”²

In other words, the South Korean government retains the legal right to re-impose capital controls in an emergency. Whether it would actually do so in a test scenario is debatable. On the one hand, if a test generated capital flight and imploding financial markets, the government would come under pressure to act. Yet the re-imposition of capital controls would not be costless, creating a new set of policy decisions about when and how to remove the controls, as well as raising the risk premium on investment in South Korea after their removal. This last point must be considered in the context of the “Korea discount”—the long-standing, if shrinking, risk premium attached to investment in South Korea. The country’s sovereign debt rating remains below the level it attained prior to the 1997–98 crisis, and despite recent increases in stock prices, South Korean

² See Bank of Korea, www.bok.or.kr/template/eng/html/inex.jsp?tbl=tbl_FM0000000066_CA0000001198 (accessed 27 December, 2005).

firms continue to trade at a discount relative to other emerging market comparators or other markets in Asia (figure 1).

South Korean behavior under this scenario is further complicated by the consideration that while the Bank of Korea would administrate such measures, it is unlikely that the Bank would impose them without the assent of the Blue House. Under the Peace and Reconciliation Policy of President Roh, the South Korean government is committed to engagement with the North and has tended to interpret North Korean behavior in a relatively benign light. This diplomatic commitment opens up the possibility that in a nuclear test scenario, the Blue House might hesitate to act fearing that to do so would underscore the significance of the North Korean action while the financial markets would respond immediately. This is particularly salient in the real world situation where it might take several days for intelligence services to confirm a North Korean announcement or for the North Koreans to confirm the conclusions of foreign intelligence agencies, as was the case with respect to the Pakistani nuclear tests in 1998. By the time the South Korean government acted, the damage would have been done, and the imposition of controls would amount to barring the barn door after the horses had bolted.

Lastly, while in a narrow sense a temporary imposition of capital controls in response to an emergency should not be of overwhelming importance, such interventions can take on a life of their own for reasons of political economy. Given the current level of xenophobia in South Korea surrounding participation by foreigners in the economy, there would undoubtedly be pressure to make permanent any closure for reasons completely unrelated to North Korea.³ How this plays out would depend on the relative political influence of groups positively and negatively affected by such policies. In the extreme, given the fairly pervasive anti-globalization and anti-foreigner sentiments apparent in South Korea today, one could envision the temporary imposition of emergency capital controls being used politically as the fulcrum on which to lever a broader, permanent reversal of market-oriented reforms in South Korea.⁴

³ See, for example, commentaries by Graham (2005), DeJonquieres (2005), and Kim and Lee (2005).

⁴ See Noland (2005b) and for additional polling data, see Pew Research Center (2003), and Chang-woon Shin and Young-gi Chun, "Koreans cast wary eye on the world," *JoongAng Ilbo*, 15 October, 2005.

It would be desirable to get a handle on the quantitative implications of this potential scenario for output, employment, and other economic outcomes of interest, both in South Korea and in other countries. The most satisfying way to simulate such a counterfactual would be to use a dynamic multi-country computable general equilibrium model with forward-looking asset markets in along the lines of McKibbin and Vines (2000), for example, which would allow one to increase the risk premium on local financial assets and then trace out the real-side economic implications. But even if one had a model, a critical issue would be to specify the magnitude of the shock to be imposed. In thinking about how to calibrate such potential shocks, two roughly comparable historical benchmarks spring to mind: the 1998 Pakistani nuclear test (to be discussed in greater detail below in reference to North Korea) and South Korea's own financial crisis in 1997-98. In the absence of a formal analytical model, one might think of these experiences as providing a kind of rough guide to the magnitudes of the effects that one might expect to observe in the North Korean nuclear test scenario.

With respect to the first benchmark, Pakistan's nuclear test was accompanied by the imposition of sanctions, the suspension of lending by the international financial institutions, a 40 percent decline in the stock market, and a currency devaluation (Figure 2). It took Pakistani asset prices more than two and one half years to recover from the shock, but eventually they did recover and in January 2006 stock prices were more than six times higher than their pre-crisis levels.

When thinking about this precedent in comparison to the prospective South Korean case, two considerations cut in opposite directions: most obviously, Pakistan was the nuclear tester—not the tester's neighbor. As the miscreant it was subjected to sanctions; South Korea as the neighbor would not be, and hence one would expect that the impact on South Korea would be milder than what Pakistan experienced.

Yet at the same time, South Korea today is much more integrated into global financial markets than Pakistan was in 1998. Its own financial crisis was traumatic: the stock market fell by 60 percent over the course of one year (though it subsequently recovered over the following year), and a collapse in economic growth (from roughly 7 percent in 1996 to -7 percent in 1998) accompanied by a rise in the unemployment rate from 2 percent in 1996 to 7 percent in 1998 (Figure 2).

Nevertheless, South Korea recovered quickly, if unevenly, and it is hard to imagine that a North Korean test would amount to a shock as large as the 1997-98 financial crisis. Moreover, the institutional development of the economy since that crisis has been such that the economy could probably absorb financial market shocks with less severe implications for the real economy than during the earlier crisis episode.

In sum, the economic implications for South Korea of a North Korean nuclear test are negative though not cataclysmic. Such conclusions are necessarily speculative, and in the absence of a formal model, vague. However, on the basis of past history one would expect that South Korea would experience a temporary decline in asset prices and investment, and, as a consequence, a modest permanent loss of income. The government would probably find it politically difficult to maintain engagement on current terms, and in a narrow budgetary sense might lose money on existing investment guarantees provided to small- and medium-sized enterprises that had invested in the North. Depending on the extent of capital flight and the government's reaction to it, these effects could be compounded by policy errors.

Japan

The neighboring economy likely to experience the second largest impact after South Korea of a North Korean nuclear test would be Japan: If there was any question, North Korea demonstrated in August 1998 that it possesses rockets capable of striking Japan's major population centers, and North Korean propaganda regularly excoriates Japan. The issue with respect to Japan would be the magnitude and persistence of any financial-market shock emanating from a North Korean test.

Japan's financial vulnerability to North Korean actions has increased in recent years due to the decline of extensive cross-shareholdings among Japanese corporations and their main bank and keiretsu affiliates (Miyajima and Kuroki 2005). Moreover, Japan has witnessed a steady increase in the prominence of foreign investors in Japan's financial markets, with foreigners now owning roughly 25 percent of Japanese stocks.⁵ Likewise, Japanese investors have increased their ownership of foreign securities in

⁵ See David Turner, "Foreign investors increase tension," *Financial Times*, 20 June, 2005, and "Foreign holdings up in Japan," *International Herald Tribune*, 14 November, 2005.

recent years and, having gotten used to investing in non-Japanese assets, might be more willing than in times past to shift money out of Japan if local financial markets were to receive a negative shock. Together, the unraveling of traditional cross-shareholding networks, the increased role of foreign investors, and the increased comfort of Japanese investors with investing outside Japan make it more difficult for the state to coordinate market outcomes and increase the possibility of capital flight.

At the same time, the government of Japan possesses huge official reserves—more than \$800 billion—with which it could support the market. The Bank of Japan (BOJ) also owns more than ¥2 trillion of Japanese equities, a legacy of an earlier “price-keeping operation” (PKO) intervention in the stock market, which by law it cannot sell until September 2007.⁶ Were North Korea to test, this “overhang” could intensify downward pressure on the Japanese market. Yet the precedent of earlier PKOs means that the government could simply extend the restriction on BOJ disinvestments and/or authorize additional purchases. Yet, as in the case of South Korea, making and implementing these political decisions would take time, and it is likely that the market would have already rendered its verdict before the BOJ acted, implying that while the government of Japan would have plenty of resources at its disposal, it would likely find itself playing catch-up.

However, unlike the South Korean case where the Roh government remains politically committed to engagement, a North Korean nuclear test would likely harden attitudes in Japan toward the North and strengthen political forces supporting rearmament. This would improve the prospects of firms likely to benefit from an increased military budget. So while a North Korean nuclear test might contribute to a general rise in risk associated with Japanese assets, depressing asset prices and investment, particular firms, for example in the heavy industry, aerospace, and high-technology sectors, might benefit. Such developments can create their own internal logic and political momentum: Military budget increases would contribute to the growth of a beneficiary military-industrial complex that might seek to perpetuate its own existence long after the North Korean threat might have disappeared.

⁶ See Leslie P. Norton, “Japan’s Bull Run Not Over Yet,” *Barron’s*, 5 December, 2005.

The bottom line question with respect to Japan is whether one would observe a permanent increase in country risk associated with the heightened external threat, resulting in a macroeconomically relevant reduction in investment and ultimately GDP growth. It is hard to calibrate such counterfactuals, but a nuclear test alone, without further threatening developments in North Korea, probably would not impose an economically relevant permanent cost on Japan. The structural changes in Japan that such an event might unleash would probably be of greater interest than the pure macroeconomic impact alone. The possibility of more dramatic threats is taken up below.

China

Of North Korea's neighbors, China would appear to be the least economically threatened by a nuclear test. While China is an open economy, relying heavily on foreign investment for its dynamism, it retains extensive capital controls and possesses official reserves approaching \$800 billion (Prasad and Wei 2005). Moreover, the engine of that economic dynamism is located in the coastal region of southern China, not the rust belt of Manchuria. Assuming that foreign investors could distinguish between Shanghai and Dandong, the direct impact of a North Korean nuclear test might be modest.

However a North Korean nuclear test would almost surely provoke a strong reaction from the United States, Japan, and the European Union, and, like the earlier case of the 1998 Pakistani nuclear test, China's response could emerge as a source of tension. The reaction of the US, Japan, and the EU could put China on the spot, and while China's direct trade links to North Korea are minimal, its reliance on the US, Japanese, and EU markets is huge. A political dispute that spilled into trade policy or simply contributed to soured trade relations with the US, Japan, and EU could significantly harm China's economy.

The importance of this possibility is underscored by the observation that among North Korea's neighbors, the Chinese government has the least room for maneuver, in the sense that the country's internal social and political stability may be importantly tied to the regime's ability to deliver economic growth. Paradoxically, a North Korean nuclear test could have more profound political reverberations in China than in South Korea or Japan, despite China's lower apparent direct exposure to negative spillovers emanating from North Korean behavior. Yet such an effect, while potentially large, is more

speculative than the more direct effects that could be expected to obtain in South Korea and Japan.

North Korea

Although North Korea remains one of the world's most autarkic economies if one looks only at merchandise trade, its exposure to the outside world is considerably higher if one considers aid and unconventional or illicit transactions as well: From a balance of payments standpoint, it appears that in recent years North Korea has derived roughly one-third of its revenues from aid, roughly one-third from conventional exports, and roughly one-third from unconventional sources (in estimated order of significance, missile sales, drug trafficking, remittances, counterfeiting, and smuggling). Remittances come mostly from a community of pro-Pyongyang ethnic Koreans in Japan and increasingly from refugees in China, who possibly number up to 100,000.

North Korea's trade is increasingly oriented toward South Korea, which in the event of a North Korean nuclear test would probably find it politically difficult to maintain engagement on current terms (which embody an element of subsidy or guarantee)—so that in contrast to the other countries discussed thus far, North Korea could suffer a noticeable, self-inflicted, direct trade shock from a nuclear test.

North Korea receives little developmental assistance (as distinct from humanitarian aid) through the multilateral system, though the minor programs that exist would probably be terminated or suspended; any hopes of gaining entry into the international financial institutions such as the International Monetary Fund, World Bank, or Asian Development Bank would be put on hold indefinitely.

A test would also galvanize diplomatic support for Proliferation Security Initiative (PSI)-type enforcement actions and strengthen multilateral backing for cracking down on illicit activities. Japan, for example, would almost surely block remittances to North Korea.

Adding it all up, the negative economic repercussions to North Korea of a nuclear test would be significant. However, the example of Pakistan in 1998–99 suggests that such a shock might be neither permanent nor politically debilitating to the regime.⁷

⁷ This discussion draws upon case study material developed for Hufbauer, Schott, and Elliott (2006).

Immediately following Pakistan's nuclear tests in May 1998, the G-8 countries imposed economic sanctions including termination of bilateral development assistance and opposition to new loans through the multilateral development banks. Pakistan began to face a balance of payments crisis and over the next two months implemented a number of austerity measures. The central bank devalued the rupee, imposed capital controls, and instituted a dual exchange rate. Share prices on the stock exchange fell by 40 percent. Capital inflows dropped. With new lending from the IMF foreclosed, the country obtained a small loan from the Islamic Development Bank. GDP growth slowed markedly.

However, by July, less than two months after the tests, the US began to backtrack. In a concession to special interest political pressure, the US government exempted farm products from the prohibition on export credits to Pakistan and indicated that it would not veto IMF funding for Pakistan, fearing a collapse. Japan followed the US lead, and the IMF and Pakistan initiated negotiations over a rescue package. In November, the US waived sanctions (except for arms exports), and the IMF announced that it would resume lending to Pakistan. In January 1999, World Bank and IMF lending resumed. Later that year, Prime Minister Nawaz Sharif was ousted by General Pervez Musharraf in a bloodless coup.

In short, in less than one year, Western countries had essentially acquiesced, removing most sanctions. Its government had been overthrown, but Pakistan suffered only temporary economic dislocation. By February 2001 asset prices had re-attained pre-crisis levels, and in September 2001, in the wake of the terrorist attacks, the US waived all remaining sanctions in recognition of Pakistan's cooperation in the war against terrorism and its importance with military action in neighboring Afghanistan imminent. Japan followed suit.

Obviously the parallels with North Korea are imperfect. But they suggest that sanctioning countries may encounter both domestic and diplomatic motivations to ease restrictions. From a North Korean standpoint, it might be reasonable to suppose that China and South Korea would be sufficiently concerned about regime collapse, as was the West in 1998 with respect to Pakistan, that they would err on the side of forbearance—a year or two of arduous marching, and there would be light at the end of

the tunnel. In any event, the past behavior of the North Korean regime suggests that it does not place a great priority on popular welfare, and it would seem reasonable to conclude that the prospective economic repercussions would be no bar to a nuclear test.

In this regard the behavior of China would be crucial. China has been the main “loser” when North Korea has acted provocatively in the past—the August 1998 missile firing over Japan, for example, contributed to enhanced military cooperation among the US, Japan, and South Korea and strengthened the hands of those in Japan supporting larger defense budgets. And while the economic costs of a North Korean test would not be enormous, the implications of such an action would not be benign—it could encourage an arms race in Northeast Asia, raising the possibility of Japan, Taiwan, and South Korea eventually going nuclear. Such developments would not be in China’s interests.

Generating a Bigger Bang

Suppose that instead of merely testing a nuclear device, North Korea was caught “red-handed” exporting fissile material or a nuclear weapon, possibly to a nonstate actor. Setting aside the possibility of any military response by the US or others, it is reasonable to assume that North Korea would be subject to comprehensive economic sanctions under a UN Security Council resolution. Sanctions aimed at political destabilization succeed about half the time (Hufbauer, Schott, and Elliott 2006). In the specific case of North Korea, statistical modeling indicates that under a comprehensive embargo scenario, the odds of a regime change in North Korea would be roughly 40 percent within the first year, with collapse likely within two years (Noland 2004). An embargo that was less complete by design (i.e., allowing for exceptions for certain categories of exchange such as humanitarian assistance) or less thoroughly implemented (i.e., there was cheating) would have an attenuated impact on regime stability. With respect to leakage, shutting down the few existing transportation links between North and South Korea and between North Korea and Russia would be straightforward, and a naval embargo to cut off sea trade would be more challenging, though not unduly so. In the past, China’s willingness and ability to seal its border with North Korea has sometimes been questioned; ironically,

the recent militarization of the border, associated with the problem of North Korean refugees, facilitates the imposition of an embargo.

The most likely outcome of an abrupt political transition in North Korea would be its eventual absorption into South Korea and its disappearance as an independent state, though clearly there are other possibilities (Noland 2004). A key issue is the extent of violence associated with this outcome. The most frightening possibilities would include a civil war in which one or more factions appealed for external assistance, possibly drawing South Korea, China, and potentially the United States, into military activities. Nevertheless, the collapse and absorption scenario is useful for illustrating some of the economic implications of abrupt political change in the North.

Relatively cheap gradual reform scenarios depend on the stability of the North Korean state and the consequent ability to maintain enormously different levels of income across the two parts of the Korean peninsula. A collapse would set in motion economic and political forces that would make it difficult, if not impossible, to maintain such enormous disparities for any protracted period. At the moment of collapse, there would be a critical need for close coordination among the militaries of South Korea, China, and the US, since presumably they will be central to maintaining order, handling refugee flows, etc. This cannot be overemphasized, though further discussion is really beyond the scope of this paper. Once the situation on the ground had stabilized, longer-run political and economic policies come to the fore.

In this regard cross-border migration could be a central economic and political issue. Put crudely, the economics come down to the movement of Southern money north or the movement of Northerners south. Migration would act as a substitute for capital transfer. The more labor was allowed to migrate, the lower the amount of capital investment necessary to reconstruct the North Korean economy. Yet migration would also contribute to social tensions and dislocation within South Korea. It is possible, though unlikely, that the South Korean government could use the Demilitarized Zone as a method of population influx control for an extended period while conditions in the North slowly improved. Rather, the political imperative would be to improve conditions in the North rapidly.

However, even under a relatively optimistic scenario of moderate, controlled cross-border migration, and rapid convergence in North Korea toward South Korean levels of productivity, bringing the level of income in North Korea to half that of the South would require a decade and hundreds of billions of dollars of investment—and contingent on the amount of investment that could be financed from abroad, internal transfers similar in relative magnitude to the German case (Noland, Robinson, and Liu 1998; Noland, Robinson, and Wang 2000; Funke and Strulik 2005; Bradford and Phillips 2006).⁸ Of course the status quo already embodies transfers—South Korea is already providing North Korea with roughly \$1 billion in assistance annually; the difference is that this assistance is provided without any real policy conditionality and presumably is allocated according to regime maintenance, not investment, priorities.

If no investment were undertaken and North Koreans were able to freely move south, North Korea would be virtually depopulated before differences in income levels were sufficiently narrowed to choke off the incentive to migrate (Noland, Robinson, and Wang 2000; Bradford and Phillips 2006). Conversely, if incomes in North Korea were raised solely by infusions of capital investment, the amount needed to choke off the incentive to migrate could be as high as \$700 billion, out of reach of the South Korean taxpayer (Noland, Robinson, and Wang 2000). Presumably neither of these outcomes is acceptable to South Korea, so the real issue is the form of an intermediate solution that would involve a combination of cross-border movements in both labor and capital.

Several key factors will determine the macroeconomic impact on South Korea, including the pure efficiency gains that could be achieved in the North through the adoption of improved economic policies; the rapidity of technological upgrading; the magnitude of cross-border migration; and the magnitude, sourcing, and composition of capital inflows. Depending on how these factors are parameterized, one can come to a variety of conclusions about the impact of a Northern collapse on the South. Choosing a plausible and prudent set of parameters, the existing professional literature suggests that over the course of a decade, the collapse and absorption scenario would yield the following results:

⁸ See Sinn and Sinn (1996), Watrin (1998), Wolf (1998), Noland (2000, chapter 8), and references therein for more extensive discussions of the German “lessons” for Korea.

- a slowing of the South Korean growth rate, a rapid acceleration of the North Korean growth rate, and an increase in peninsular output relative to the no collapse scenario (Noland, Robinson, and Wang 2000; Funke and Strulik 2005; Bradford and Phillips 2006);
- within South Korea a shifting of income from labor to capital, and within labor, from relatively low-skilled to relatively high-skilled labor. If one assumes that capital is predominately owned by high-skilled labor, then this suggests that the process will be accompanied by increased income and wealth inequality in South Korea (Noland, Robinson, and Liu 1998; Noland, Robinson, and Wang 2000);
- across the various sectors of the South Korean economy, a tendency for sectors such as construction to expand, while internationally traded goods sectors would be disadvantaged (Noland, Robinson, and Liu 1998; Noland, Robinson, and Wang 2000; Bradford and Phillips 2006); and
- a modest peace dividend in the South and a huge peace dividend in the North (Noland, Robinson, and Wang 2000; Bradford and Phillips 2006; Yoon 2006).

Conclusion

South Korea is the most economically vulnerable of North Korea's neighbors to destabilizing shocks emanating from that source. Mildly provocative North Korean behavior could provoke capital flight and raise awkward policy issues for the South. More provocative behavior by the North could trigger reactions by external powers that could ultimately end in regime change and an abrupt unification that would have significant ramifications for the South Korea economy.

Japan is less vulnerable than South Korea, and the interesting economic effects that provocative North Korean behavior could possibly engender relate more to encouraging a medium- to long-term process of re-militarization in Japan than to short-run capital flight issues as in South Korea.

China's direct economic exposure to the vagaries of North Korean behavior is relatively slight, but North Korean provocations could ultimately have profound economic and political effects if disagreements over North Korea contributed to a deterioration in China's economic relationships with the US, Japan, and the EU, three

markets with which China's continued economic success—and by extension its internal political stability—are intimately linked.

In short, the economic implications of a nuclear test for the region while not catastrophic, would not be benign. However, the likelihood of adverse economic repercussions is unlikely to pose a significant constraint on North Korean actions, and it is not difficult to come up with a scenario in which North Korean behavior does indeed convey large negative economic spillovers to its neighbors. This simply underscores the importance of cooperation to deter provocative behavior on the part of North Korea.

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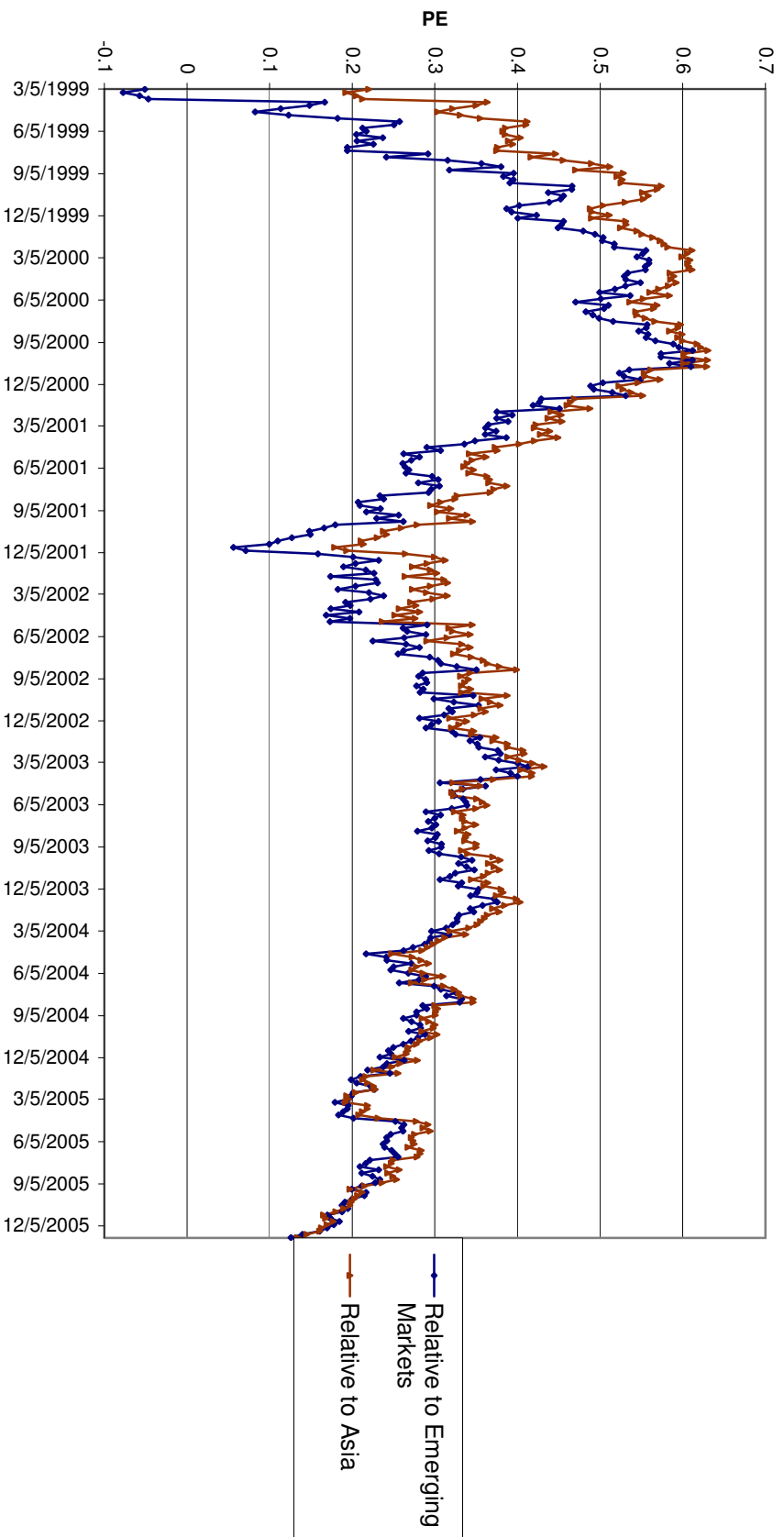
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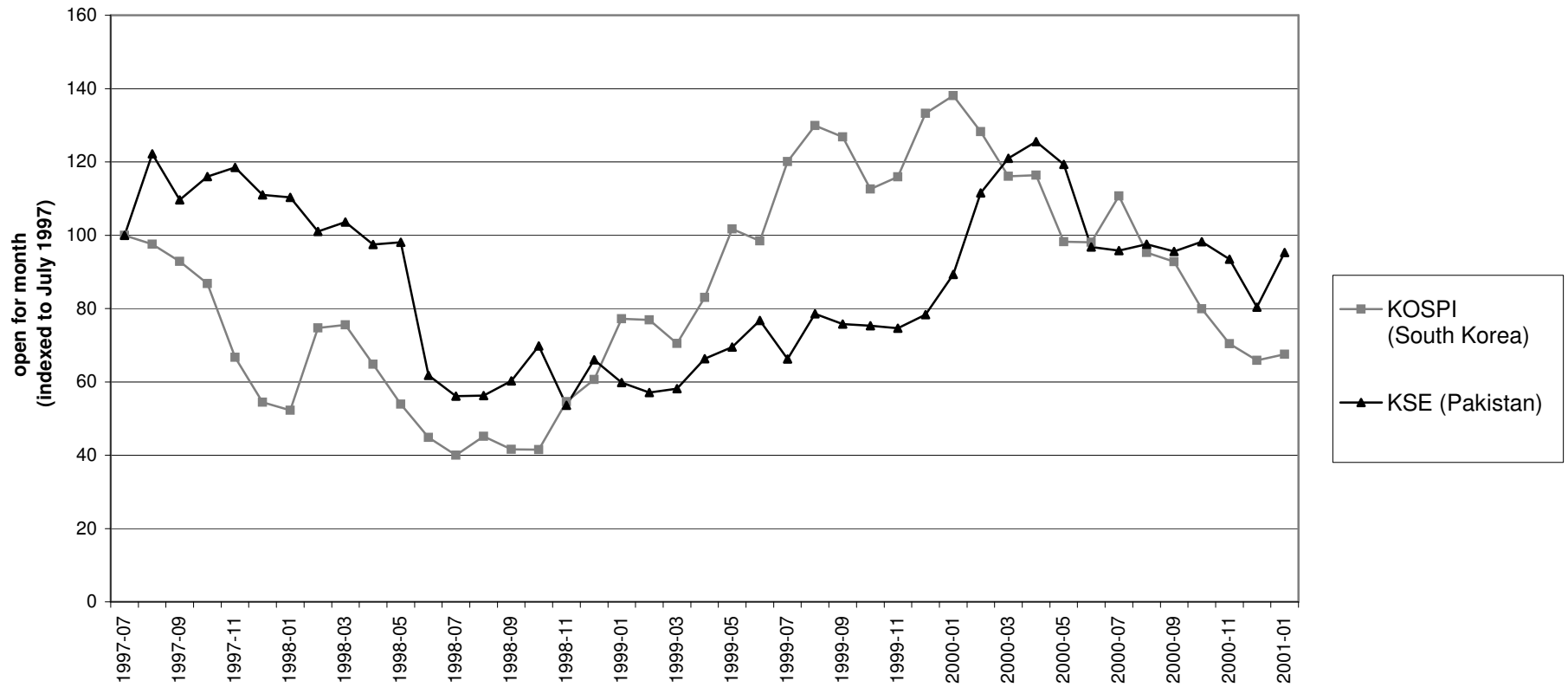
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Figure 1 Korea Discount



Note: Korea discount calculated on the basis of estimated forward earnings.
Source: Author's calculation; Bear, Stearns & Co.

Figure 2 South Korea and Pakistan Stock Market Trends



Sources: <http://finance.yahoo.com> (KOSPI) and <http://www.econstats.com> (KSE)