

Economic Reform during the First Four Years of Kim Jong-un's Rule: An Analysis Based on the CRE Model

Rudiger Frank

The paper evaluates the effects of domestic and external actions on the probability of reform in North Korea. It applies the theory of Janos Kornai on socialist systems, in particular the main line of causation, as well as elements of rational choice theory. The CRE model provides a tool for systematically processing information on North Korea that is typically incomplete. The effects of 23 actions that have taken place since 2012 in the fields of ideology, property rights, coordination, military affairs and external influence are discussed. The combined outcome is mixed and corresponds with reality, where neither a retreat to pre-1990 socialism nor a full-fledged reform could be observed. However, new insights are found on single effects and their interplay. This provides a practical tool for scholars who aim for a systematic understanding of the past, and for politicians who need to conduct an advance impact analysis of future policies.

Keywords: North Korea, Reform, Socialist Transformation, CRE Model, Kim Jong-un Government

Relevance, Research Goal and Methodology

North Korea has been the focus of scholarly discussion for a number of reasons. Its geopolitical situation in a triangle between the important East Asian economies of China, Japan and South Korea makes it relevant from the perspective of regional and global stability. The bellicose rhetoric of the leadership and in particular its nuclear program have sparked security concerns.¹ The humanitarian catastrophe

1. Somini Sengupta, David E. Sanger and Sang-Hun Choe, "Security Council

culminating in the famine around 1995-1997 as well as the human rights situation have further increased international attention.² The fact that the system has not collapsed despite internal problems and external pressure has led to an intensified debate on North Korea among academics.³

The question of regime stability and of economic reform in North Korea is thus of relevance both for scholars who are interested in issues like the sources of stability of autocratic regimes or systemic transformation and for practitioners who need to be able to evaluate the effectiveness of their past and future policies.

Due to the limited accessibility of North Korea for systematic fieldwork and the secretive nature of the government, the academic debate on reform in North Korea is typically characterized by a lack of reliable information. This applies to the most basic quantitative data such as macroeconomic indicators, as well as to qualitative insights into policies, strategies, and actor constellations. Nevertheless, it would be wrong to assume that we know nothing about the current status of the North Korean economy and society. Empirical information is rare, but it exists.⁴ The North Korean political and economic system is in many ways unique due to the specific historic conditions under which it emerged and the personalities that have shaped it, but it remains in principle an economy, a nation state, and more specifically a socialist dictatorship. All these are well-researched concepts for organizing societal and economic relations.⁵

Condemns Nuclear Test by North Korea," *The New York Times*, June 1, 2016, <http://www.nytimes.com/2016/01/07/world/asia/north-korea-hydrogen-bomb-claim-reactions.html?_r=0> (accessed January 10, 2016).

2. Hazel Smith, *Hungry for Peace: International Security, Humanitarian Assistance, and Social Change in North Korea* (Washington, D.C.: United States Institute of Peace, 2005)
3. J. H. Ahn, "Researchers: Predictions of N. Korean Collapse Wishful Thinking," *NK News*, November 26, 2015, <<http://www.nknews.org/2015/11/researchers-predictions-of-n-korean-collapse-wishful-thinking>> (accessed December 27, 2015).
4. Hazel Smith, *North Korea: Markets and Military Rule* (Chichester and New York: Columbia University Press, 2015).

The term “reform” is used frequently and typically implies some kind of change of policy, but it needs to be more precisely defined in order to avoid misunderstandings. This research follows the work of Janos Kornai; in order to be called a reform, changes need to be sufficiently deep and radical, and they must affect the first three blocks of the main line of causality, namely ideology and political power, property rights, and coordination.⁶ A reform thus amounts to a change of the economic system, although it not necessarily means an immediate regime change. Change can happen as a top-down process, but also as the result of an uncoordinated grassroots movement. Much of the development observed in North Korea since the mid-1990s has been the result of reform from below, but also consisted of actions or non-actions by the leadership and external forces.

To a certain degree, we understand the current North Korean system. Despite limitations, we also have quantitative and qualitative information available, but our empirical dataset on North Korea is not complete. We need a model that allows us to systematically incorporate all the randomly available information on North Korea with the goal of improving our understanding of the probability of reforms, and of the potential effects of particular policies.

With the above in mind, an early version of Comprehensive Reform Equation (CRE) has been created.⁷ In this paper, it will be revised and refined, and then applied to the actual situation in North Korea under Kim Jong-un.

The purpose of this article is thus to gain a systematic understanding of the impact of various domestic and external policy measures taken in the years 2012-2015 on the progress and the probability

5. Janos Kornai, *The Socialist System: The Political Economy of Communism* (Princeton: Princeton University Press, 1992).

6. Janos Kornai, *From Socialism to Capitalism: Eight Essays* (Budapest and New York: Central European University Press, 2008), pp. 2ff. See also Janos Kornai, “The Soft Budget Constraint,” *Kyklos* 39 (1989), pp. 3-30.

7. Rudiger Frank, “Reforming the North Korean Economy: Understanding Reform and Transformation through the CRE Model,” in *North Korea Demystified*, Han S. Park (Amherst, NY: Cambria Press, 2013), pp. 81-105.

of economic reform in North Korea by using an updated version of the CRE model.

The CRE Model

The CRE model is based on the understanding that in every economic system there are winners and losers. The former will have an interest in maintaining the system, while the latter will be interested in a change. This change and its probability of occurring stand at the center of the CRE model inquiry. We share the approach of the realist theory of international relations, where interests are defined as power.⁸ It makes a difference if winners or losers are more or less powerful.

The options for influencing the outcome of this competition of interests by changing single variables become more obvious if we write the above in the form of an equation. Our target variable is the probability of reforms R , reform being defined as a set of measures that change the existing economic system to the extent that they impact the first three blocks of Kornai's main line of causality. It is determined by the balance of support for reforms S_R and opposition or non-support to reforms N_R . Reform support and non-support are treated here as domestic (North Korean) variables which can be influenced by domestic and external actions.

$$(1) R = S_R - N_R$$

This simple equation already carries an important insight: reforms can be promoted in two different ways, either by targeting the support of reform or its non-support side. A measure that achieves the former is the backing of opposition forces, for example through the sending of propaganda balloons or by sponsoring Christian networks in North Korea. Policies like sanctions or the offer of closer economic

8. Hans J. Morgenthau, *Politics among Nations: The Struggle for Power and Peace* (Boston et al.: McGraw Hill 1948/2006).

cooperation try to influence those who are not willing to reform. Likewise, strategies to prevent reforms include measures targeting both groups.

However, equation (1) is not sophisticated enough to evaluate the effectiveness of policy measures in sufficient depth. We thus have to further refine it to include factors that influence its two core components S_R (support of reform) and N_R (no support of reform).

Reform support depends on the number of supporters X_S and on their ability to enforce their interest by their power P_S . The same applies to reform opposition, which depends on the number of non-supporters X_N and on their power P_N .

$$(2) S_R = X_S \cdot P_S$$

$$(3) N_R = X_N \cdot P_N$$

We can now substitute equations (2) and (3) into equation (1) to reach

$$(4) R = (X_S \cdot P_S) - (X_N \cdot P_N)$$

Furthermore, we can assume that North Koreans are de facto either supporters of reform or non-supporters. This also applies to individuals who are indifferent and decide not to act; they will reduce the share of those who are interested in a change and can therefore be regarded as non-supporters. The total number of supporters and non-supporters of reform in North Korea is thus equal to 100 percent of the country's population. To a certain degree, we can assume that like X , power P is a zero-sum game, i.e., that P_S grows if P_N decreases, and vice versa, and that the combined power of supporters and non-supporters of reform in North Korea equals 100 percent.

Equation (4) shows that the likeliness of reform R can be influenced in two ways: either by targeting the number of supporters and opponents, or by targeting their respective power. The effects of both approaches can offset each other. If the number of reform supporters grows, while at the same time their power decreases, the balance between support and opposition can remain stable or tilt in both

directions.

This leads to another important insight. Even the most promising and appropriate policy will not yield the expected result if it is offset by another, seemingly unrelated measure. This might have happened to the Sunshine policy of Kim Dae-jung, which coincided with the hardline policy of George W. Bush.

In the next step, to further refine our reform equation we assume that North Koreans share the basic characteristics of the *homo economicus*. They will typically try to maximize their utility by increasing perceived gains and minimizing perceived losses. As indicated above, both the existing system and a new (reformed) system will create winners and losers. It will be difficult to quantify these gains and losses, but it is useful to consider that individual willingness or non-willingness to support reform will also be a function of actual or anticipated gains from reform (G_R), losses from reform (L_R), gains from non-reform (G_N) and losses from non-reform (L_N).

$$(4.1) R = f(G_R, L_R, G_N, L_N)$$

To add more detail to (4.1), it is helpful to consider that some non-supporters of reforms are likely to perceive a net gain from the current system, while some supporters of reform are (actual or perceived) net losers. Likewise, some non-supporters of reforms are likely to perceive a net loss from reform, while some supporters of reform expect to be net winners. We thus assume the existence of a correlation between perceived effects and behavior.

The question of perceived gains and losses is important, as shown by the example of previous systemic reforms including German unification. Effects of a reform are multiple and heterogeneous.⁹ Most individuals will be both winners and losers to an extent. What matters is the (perceived) net balance. An example is North Korean defectors now living in South Korea who have gained political freedom and

9. Karl-Heinz Paqué, *Die Bilanz: Eine wirtschaftliche Analyse der Deutschen Einheit* (Munich: Hanser Verlag, 2009).

food security but at the same time incurred losses of social status, family and other factors.¹⁰ To be a supporter of reform (X_R), the perceived balance of gains and losses from reform must be bigger than the balance of gains and losses from non-reform, and smaller for non-supporters of reform (X_N). Actual gains and losses also influence the power of reform supporters and of reform opponents P_R and P_S , and as a consequence also of S_R and N_R .

$$(4.2) (G_R - L_R) > (G_N - L_N) \text{ for } X_S, P_S \text{ and } S_R$$

$$(4.3) (G_R - L_R) < (G_N - L_N) \text{ for } X_N, P_N \text{ and } N_R$$

In an earlier form of the CRE, domestic and external factors had been included as variables. This differentiation turned out to be irrelevant as gains and losses can be influenced by both types of factors in both directions. In other words, the CRE is as relevant for Kim Jong-un as it is for the leaders of South Korea or the USA. It will help us to understand the effects of deliberate policies as well as of random events.

If we summarize all these insights, we reach the updated version of the comprehensive reform equation:

$$(5) R = f(S_R, N_R) = (X_S \cdot P_S) - (X_N \cdot P_N) = f(G_R, L_R, G_N, L_N)$$

$$(5.1) (G_R - L_R) > (G_N - L_N) \text{ for } X_S, P_S \text{ and } S_R$$

$$(5.2) (G_R - L_R) < (G_N - L_N) \text{ for } X_N, P_N \text{ and } N_R$$

With the help of this updated CRE and its eight core variables $X_S, P_S, X_N, P_N, G_R, L_R, G_N$ and L_N , we can now discuss the effects of any domestic or external policy measure, natural disaster, world market change, or other occurrence on the probability of reform in North Korea. We can also try to interpret the direction and effect of Kim Jong-un's policies since he took the leadership of the country in late 2011.

10. For an extreme case, see Sang-hun Choe, "A North Korean Defector's Regret," *The New York Times*, August 15, 2015, <http://www.nytimes.com/2015/08/16/world/asia/kim-ryen-hi-north-korean-defector-regret.html?_r=0> (accessed December 27, 2015).

Application of the CRE: Opportunities and Limitations

For the application of the CRE model, it is important to determine which kind of empirical information we need, and in particular, whether we look at the behavior of specific actors. Another important question is whether we focus on intentions or outcomes.

The “game” of reforming North Korea (in the economic sense of the term) involves a number of players. Some of these are easily identifiable, relatively speaking, such as the North Korean leadership or government (“Pyongyang”) and external players such as South Korea (“Seoul”), the USA (“Washington”), or China (“Beijing”). Some are less well defined, such as the North Korean people, the North Korean military, or the North Korean middle class. Providing a complete set of players and an appropriate detailed definition for each of these groups would go far beyond the scope of this paper, especially if we consider that they are neither homogeneous in their composition nor consistent in their goals. Attempts to identify their objectives are speculative and thus methodologically questionable.

We therefore refrain from making detailed statements about the intentions of single actors. For the purpose of this article, we only assume that the current North Korean government, headed by First Chairman Kim Jong-un, has the power to change the existing system but has so far chosen not to do so. Pyongyang seems to be interested in regime stability; this position is widely accepted in the literature.¹¹

Considering the analytical difficulties in defining actors and identifying their *goals*, we instead look at *actions* (including, but not limited to policies) and, most importantly, on their *effects*. Based on the CRE model, we ask which of the eight variables of the CRE have been affected, including the four outcome-related variables G_N , L_N , G_R and L_R , the two variables for quantity X_S and X_N , and the two power variables P_S and P_N .

Let us, for example, return to the observation that Pyongyang

11. Young Whan Kihl and Hong Nack Kim, *North Korea: The Politics of Regime Survival* (London and New York: Routledge, 2006).

favors regime stability. If this is true, the CRE suggests that Kim Jong-un and his supporters have so far perceived the net gains of non-reform ($G_N - L_N$) to be bigger than the net gains of reform ($G_R - L_R$). Even if the leadership expects non-reform to be essentially a losing game, it will hew to a non-reform course of action if the perceived losses from reform will be even bigger. This would explain why no reform measures have been taken despite indications that many supporters of the North Korean system are not satisfied with the current economic situation.¹² They may not be convinced that they will be better off after reforms and thus choose a loss-minimizing strategy.

This approach has its limitations. Due to the quality of our empirical dataset from North Korea, we will not be able to reach final conclusions on each of the eight variables or draw authoritative conclusions on the probability of reform. Nevertheless, we will be able to understand the interrelatedness of various actions, and the fact that their effects are multiple. Also, we will more precisely identify gaps in our knowledge of the subject. This will point at areas in which further research — and the investment of related resources — is necessary.

Policy makers can use the CRE to conduct a multi-dimensional impact analysis of actions before they are taken, which will improve their effectiveness.

Selected Actions and their Effects on the CRE

After establishing the factors within the CRE model, deciding to focus on actions rather than actors, and declining to investigate the intentions behind these actions, we can now explore certain aspects of the empirical side of North Korean reform.

To proceed systematically, we will first look at the above men-

12. Donald Kirk, "Brutal Killing of N. Korea Military Chief Reflects Kim Jong-Un's Insecurity, High-Level Discontent," *Forbes Asia*, May 14, 2015, <<http://www.forbes.com/sites/donaldkirk/2015/05/14/brutal-execution-of-n-korea-military-chief-reflects-kim-jong-uns-insecurity-high-level-discontent/#697c92e73485>> (accessed January 4, 2016).

tioned blocks of Kornai's "main line of causation" of events that have consequences for economic reform. Which actions have occurred since 2012 in the fields of ideology and political power (I), property rights (P), and coordination (C)?

This is a complex endeavor. We selected the variables to represent each field based on our long-term experience with North Korea, but they still remain somewhat arbitrary. This has no effect on the discussion of the effects of single actions, but it will impact our overall assessment of the probability of reform since we may omit crucial actions. From an empirical perspective, this paper thus remains incomplete. The discussion of the effects below should be seen as a demonstration of how to interpret the effects of changes in single variables using the CRE model. The model is open to supplementation based on past actions as well as to the inclusion of actions that will take place in the future.

The effects (E) of actual actions on these blocks will be listed in the form EX_Y . E stands for effect, X indicates the respective block or field, and Y is the number of the effect in the same block or field. The quantification of the effects on the different variables of the CRE will not be possible, but a positive effect (+) or a negative effect (-) can be indicated. We will therefore be able to say whether the change in the probability of reform ΔR as a consequence of a particular action or set of actions will be positive (+), negative (-), or whether no clear answer is possible (\pm). However, it should be noted that the relevance and the actual impact of the single variables can differ strongly. Any application of the CRE model therefore requires a high degree of contextualization.

After discussing the potential impact of these actions on the CRE, we will consider additional North Korean actions in the military (M) field before turning to actions by external forces, including sanctions (Ex).

Ideology and Political Power

The existence of a dominant ideology and the undivided power of the Communist Party are the core components of the first block of Kornai's main line of causation.¹³ Two notable developments in the field of North Korea's ideology since 2012 have been the ideological merger of Kim Il-sung and Kim Jong-il¹⁴ and the tacit substitution of the Military-First-Policy (*sŏn'gun*)¹⁵ by the policy of a parallel development of nuclear arms and the economy (*pyŏngjin*). The power of the Party, if ever threatened, has been strengthened under Kim Jong-un's rule. This normalization was expressed through convening the 4th Conference¹⁶ of the Worker's Party of Korea (WPK) in April 2012 and the announcement of the 7th Congress of the WPK to be held in May 2016, after a hiatus of no less than 36 years.¹⁷

The merger of the two deceased leaders is related to the third-generation succession from Kim Jong-il to Kim Jong-un, a process that, compared to the second-generation succession, received relatively

13. Kornai, *The Socialist System*, p. 336.

14. The ideological merger of the two deceased leaders is symbolized by the replacement of the old (built in 1972) Kim Il-sung statue on Mansudae Hill in Pyongyang by a revised version and an additional Kim Jong-il statue of the same size in 2012, and by the issuing of a new lapel pin combining the images of the two leaders. The ideology of Kimilsungism has been renamed Kimilsung-Kimjongilism.

15. Except for names, we have chosen to romanize Korean terms by using the McCune/Reischauer system.

16. A Party Conference is a major Party event that is usually held between Party Congresses in case of the necessity of major strategic and personnel decisions. The Party Conference of September 2010 was only the 3rd in North Korean history after the 2nd Party Conference in 1966. The 2010 event was linked directly to Kim Jong-un because there he was for the first time presented to the public and received a number of posts. See Rudiger Frank, "A Puzzle in Pyongyang," *Foreign Policy*, August 10, 2010, <http://www.foreignpolicy.com/articles/2010/10/08/a_puzzle_in_pyongyang> (accessed January 5, 2016).

17. "7th Congress of WPK to be Convened," *KCNA*, October 30, 2015, <www.kcna.kp> (accessed January 3, 2016).

poor preparation. A full discussion of the details is outside the scope of this research; we do need to ask, however, how that process would affect the CRE.

What happens to a strongly authoritarian system¹⁸ like North Korea when the leader passes away? The system loses its stability since its main pillar, the leader, is gone. Support of the current system decreases suddenly.¹⁹ This is a trend that could be observed after the death of Kim Il-sung in 1994 as well as in the second succession case in late 2011. The new leader will seek to reestablish stability and trust, but this takes time and is inherently difficult, since it amounts to the replacement of a near-deity. It is thus usually assumed that Kim Jong-un's legitimacy is weaker than that of his two predecessors.²⁰ All this will have led to an immediate reduction of X_N after the death of Kim Jong-il in December 2011.

Kim Jong-un had to react quickly to nevertheless keep the product $N_R = X_N \cdot P_N$ (no support of reform) constant. In the short run, this would suggest an increase of P_N (power of non-supporters of reform) by promotions or by measures to quickly generate support for him as a person. The classical instrument for that purpose in North Korea is the "on-the-spot guidances" (*hyŏnji chido*), which he started using in October 2010.²¹ A new tactic was the first-ever introduction of a first lady as a public figure in mid-2012.²²

18. Robert Scalapino, *North Korea at a Crossroads* (Stanford: Stanford University Press, 1997).

19. For the account of former North Korean Colonel Kim Jong Ryul, who decided to defect after he learned about Kim Il-sung's death in 1994, see Dardan Gashi and Ingrid Steiner-Gashi, *Im Dienst des Diktators* (Vienna: Ueberreuther, 2010).

20. Jin-sung Jang, *Dear Leader: My Escape from North Korea* (New York: 37 Ink, 2014).

21. Jae-Cheon Lim, *Leader Symbols and Personality Cult in North Korea* (London and New York: Routledge, 2015).

22. It has been discussed whether this was meant to generate sympathy by showing a more human face of the leader, or to reduce concerns over his youth by showing that he is a married man. The effect of both options on the CRE would, however, be the same.

- Effect El_1 (promotions and leader image):

$$\Delta R = [X_S \cdot P_S] - [X_N \cdot P_N (+)] = (-)$$

Simultaneously, Kim Jong-un could focus on the other part of the CRE by reducing the value for reform support, S_R . In addition to implicitly weakening the power of reform supporters, P_S , by strengthening P_N , a more direct action including the reduction of their number, X_S , would be a logical choice. The purges that have been reported since 2012 can be understood from this perspective.²³ They have reduced the number of actual or potential opponents and transferred their power to the system's supporters. This policy was not limited to the elite. There are many reports on attempts to crack down on illegal border crossings, a policy that resulted in a significant reduction in the number of refugees since Kim Jong-un took power.²⁴

- El_2 (purges): $\Delta R = [X_S (-) \cdot P_S] - [X_N \cdot P_N (+)] = (-)$

As long as the control of the state could be maintained and a coup could be prevented, the effects of these actions on the CRE would be negative.

In a second step, Kim Jong-un would have to increase his number of supporters. The various measures to normalize the role of the Party can be interpreted as primarily strengthening the number of, X_N , and power of, P_N , the loyal, non-reformist part of North Korea's population. Heeding his father's advice,²⁵ Kim Jong-un seems to have understood that ideology is the key to political power. The Party is the keeper of ideology.

23. Alastair Gale, "Suspicion Rises of a North Korean Purge," *The Wall Street Journal*, November 12, 2015, <<http://www.wsj.com/articles/suspicion-rises-over-a-north-korean-purge-1447298765>> (accessed December 27, 2015).

24. "Number of N. K. Defectors Halves after Kim Jong-un Assumes Power," *Yonhap*, January 4, 2016, <http://english.yonhapnews.co.kr/dev/2703000000.html?cid=AEN20160104004100315>.

25. Jong-il Kim, *Giving Priority to Ideological Work is Essential for Accomplishing Socialism*, 1995, <www.korea-dprk.info> (accessed December 27, 2015).

- EI_3 (strengthening of the party):

$$\Delta R = [X_S \cdot P_S] - [X_N (+) \cdot P_N (+)] = (-)$$

Again, the effect on the CRE would be clearly negative, as long as he can ensure that the Party remains primarily loyal to the leader and does not become a reform-supporting institution. The experience of the former socialist countries has shown how quickly and profoundly such a situation can change, however.²⁶ It requires constant efforts by the leadership to secure the Party's loyalty.

In addition to the two main ideological developments, we observed measures with an instant effect on N_R (no support of reform) that can be summarized as "bread and circus" policies. They included symbolic efforts as well as actual measures to "improve the people's living" (*inmin saenghwal hyangsang*) and the renovation or building of a number of entertainment facilities such as the Mirim Riding Club, the Munsu Water Park, the Mangyongdae Funfair or the Kaeson Funfair, to name just a few. The most recent example of that policy was the Masik Ski Resort.²⁷ The creation of the all-female Moranbong Band in June 2012 on personal order of Kim Jong-un can also be seen as part of the "bread and circus" policies.

We could argue that these measures all positively affected the quantity variable X_N in a very straightforward way by increasing G_N , the gains of maintaining the current system, while leaving the other components of the inequality $(G_R - L_R) < (G_N - L_N)$ constant.

- EI_4 (bread and circus): $\Delta R = [X_S \cdot P_S] - [X_N (+) \cdot P_N] = (-)$

The introduction of the "pyŏngjin line" in March 2013 lifts economic development to the same priority as the military and thus is a de facto significant deviation from the "Military First" policy.²⁸ The

26. Dieter Segert, *Transformationen in Osteuropa im 20. Jahrhundert* (Stuttgart: UTB, 2013).

27. "Inside Masikryong: North Korea's New Ski Resort," *The Guardian*, April 28, 2014, <<http://www.theguardian.com/world/2014/apr/28/masikryong-north-koreas-new-ski-resort>> (accessed January 4, 2016).

announcement of such a policy is equivalent to the promise of better living conditions and thus corresponds with the “bread” component of the above mentioned “bread and circus” policies. The CRE effect would thus be on X_N by way of increasing G_N , the anticipated or actual gains from non-reform.

We will stop elaborating on the effects of ideology-related policies on the CRE here since the connection has become sufficiently clear and the main developments since 2012 have been briefly touched upon. It seems, not surprisingly, that the ideological measures taken since 2012 have reduced the probability of reform. With the intent of limiting our assumptions as much as possible, this might exactly have been their goal.

We should, however, consider that the results as discussed above are only of a temporary nature. In particular promises, including the improvement in the quality of people’s lives, as they were prominently repeated in the 2016 New Year Address,²⁹ will only have lasting positive effects on X_N by way of increasing G_N if they are followed by actual improvements. This is important to understand if we try to evaluate the policy options of Kim Jong-un for the future.

- EI_5 (unfulfilled promises): $\Delta R = [X_S (+) \cdot P_S] - [X_N \cdot P_N] = (-)$

Effect EI_5 shows this clearly. Unfulfilled promises will not only fail to increase X_N , they will also increase X_S (which leads to a simultaneous decrease of X_N because of $X_S + X_N = 100\%$). Kim Jong-un is more or less without many alternatives to being economically successful, if he wants to prevent a regime change.

28. Rudiger Frank, “Can North Korea Prioritize Nukes and the Economy at the Same Time?” *Global Asia* 9, no. 1 (Spring 2014), pp. 38-42.

29. “경애하는 김정은동지의 신년사,” KCNA, January 1, 2016, <www.kcna.kp> (accessed January 2, 2016).

Property Rights

During the 2012-2015 period, there were no policies explicitly and significantly shifting Kornai's second block (the existing system of property rights (*P*)) away from the currently dominant state and quasi-ownership. There is anecdotal evidence on the de facto and ad hoc introduction of private property rights in the areas of real estate, mining, fishing, transportation, and other businesses,³⁰ but it is difficult to confirm whether these reports are true and if so, whether they apply to the whole economy or only to selected geographical areas. In addition, most of these reports were already circulating during the rule of Kim Jong-il, so they leave Kim Jong-un's CRE unchanged. Moreover, the large-scale privatization of land and factories would amount to what we typically assume to be an economic reform. A discussion of the effects on the CRE would amount to circular reasoning.

With this in mind, we can nevertheless discuss the effects of limited and gradual property rights changes on the CRE that fall short of a real reform; for example, the privatization of a small amount of land. This occurred with the legalization of the so-called kitchen gardens, which are even explicitly mentioned in the North Korean constitution.³¹ The so-called "June 28 measures" of 2012 point in a similar direction, including an enlargement of the size of the kitchen gardens.³²

The productivity of these private plots is significantly higher than that of collective farms.³³ This evidence provides tangible evidence to

30. Andrei Lankov, "Kim Jong-un: What we know about the North Korean Leader," *Al Jazeera*, January 7, 2016, <<http://www.aljazeera.com/indepth/opinion/2016/01/kim-jong-north-korean-leader-160104121310318.html>> (accessed January 8, 2016).

31. See Article 24, 사회주의 헌법 <<http://naenara.com.kp/ko/great/constitution.php>> (accessed December 27, 2015).

32. Allegedly, farmers can keep a certain percentage of their production, rather than handing everything to the state, and sell it on the markets for profit. Zachary Keck, "North Korea Pushes Ahead on Agricultural Reforms," *The Diplomat*, May 17, 2013, <<http://thediplomat.com/2013/05/north-korea-pushes-ahead-on-agricultural-reform>> (accessed December 20, 2015).

support the expectation that more such reforms will further improve economic outcomes. The perceived gains from reforms G_R will grow, and will thus increase X_S , the number of reform supporters.

- EP_1 (private plots): $\Delta R = [X_S (+) \cdot P_S] - [X_N \cdot P_N] = (+)$

Actual gains from reforms G_R will increase the economic resources of those who own such private plots through the profits they can make by selling their products on the market. This will positively affect P_S , the power of reform supporters.

- EP_2 (private plots): $\Delta R = [X_S \cdot P_S (+)] - [X_N \cdot P_N] = (+)$

We see that a small-scale change in property rights towards privatization will significantly affect both sides of equation $S_R = X_S \cdot P_S$ and thus lead to a positive ΔR , a change in the probability of reform. However, there might be other, even adverse effects of privatization. Some of them are discussed in the section below.

Coordination

Coordination is the third of Kornai's blocks. In state socialist systems, it is typically bureaucratic. The administration decides what to produce, how much, how to distribute, and at what price. An extreme form of the latter would be rationing, where the price is set at a level equal to or near zero. This has been reality in North Korea for a number of key products for a long period.³⁴ The alternative to bureaucratic coordination is coordination through markets, where the quantity, quality and price of economic production are "decided" in a decentralized way.

33. See, for example, FAO, "FAO/WFP Crop and Food Security Assessment Mission to the DPRK," November 16, 2010, <<http://www.fao.org/docrep/013/a1968e/a1968e00.htm>> (accessed December 20, 2015).

34. Marcus Noland, *Avoiding the Apocalypse: The Future of the Two Koreas* (Washington, D.C.: Institute for International Economics, 2000).

The marketization of parts of the North Korean economy, in particular in the areas of food and consumer goods such as textiles, transpired before the tenure of Kim Jong-un.³⁵ However, their importance seems to have grown. The number of markets in the whole country was reportedly around 380 by the end of 2015, and their size has expanded during the last few years.³⁶

The effects of a switch in coordination from state to market, from bureaucrats to traders and clients, are massive and numerous if seen from the CRE perspective. They do not, however, all point in the same direction. This helps explain why the introduction of market coordination does not immediately lead to a change of system and regime.

Let us look at the coordinators first. The bureaucrats used to wield enormous power when they had a monopoly on coordination; this monopoly is now gone, and their power has been reduced. This will make them losers of reform and qualify them as reform opponents. Since they were beneficiaries of the old system, they had already in all likelihood been opponents of reform, leaving X_N unchanged. A reduction of their power negatively affects P_N .

- EC_1 (marketization): $\Delta R = [X_S \cdot P_S] - [X_N \cdot P_N (-)] = (+)$

Simultaneously, the reduction in the need for bureaucratic coordination would typically over time lead to a smaller bureaucracy and thus to a reduction of X_N . We have no reliable evidence on this, but we do know that the number of alternative “coordinators,” namely the aforementioned traders and their clients, has increased significantly along with the physical growth of the number and size of markets, as detailed above. This means that both the power, P_S , and the number of reform supporters, X_S , have grown.

35. Stephan Haggard and Marcus Noland, *Famine in North Korea: Markets, Aid, and Reform* (New York: Columbia University Press, 2007).

36. Benjamin Katzeff Silberstein, *Growth and Geography of Markets in North Korea: New Evidence from Satellite Imagery* (Washington D.C.: US-Korea Institute, 2015).

- EC_2 (marketization): $\Delta R = [X_S (+) \cdot P_S (+)] - [X_N \cdot P_N] = (+)$

Even without reductions to the number of bureaucrats, the number of reform opponents stemming from this group could have decreased. We have shown above that the bureaucrats have in principle incurred a loss, L_R , due to marketization from reductions in their influence. However, a new or improved way of benefitting has also emerged: corruption.

Marketization has reduced the relevance of the provider of political capital, the state, and of its distribution mechanism, the bureaucracy. But the latter has not been replaced in the course of the changes in North Korea; only its monopoly on coordination was broken. Bureaucrats still wield substantial power, in the form of police and security officers, who check the proper behavior of traders; officials, who hand out licenses for trading in markets; or trade officials, who arrange export and import. There is anecdotal evidence that corruption has increased significantly.³⁷

The effect of corruption on the CRE is interesting: It strengthens the power of a part of the bureaucracy. Wouldn't this partly offset effect EC_1 ? We argue that it will not, because power will only increase for the part of the bureaucracy that benefits from corruption. Their G_R increases, and in hope for more they turn from opponents to supporters of reform. In other words, X_S will increase, and X_N will decrease, and power will be transferred to the camp of the reform supporters, becoming P_S .

- EC_3 (corruption): $\Delta R = [X_S (+) \cdot P_S (+)] - [X_N (-) \cdot P_N] = (+)$

The magnitude of effect EC_3 depends on the number of bureaucrats benefitting from corruption. The positive effect of corruption on the probability of reform lasts as long as the beneficiaries of the changed

37. Transparency International listed North Korea as one of the two most corrupt countries in the world. See "Corruption by Country/Territory," Transparency International, <<https://www.transparency.org/country/#PRK>> (accessed December 21, 2015).

system can expect more opportunities for gains G_R and a reduction in their perceived losses from reforms L_R . A policy that combines a reduction in the coordinating role of the state with alternative opportunities for bureaucrats to benefit will not meet as much resistance as we would typically expect from a group that sees its original power drop so significantly. A reform policy that too early and too strongly aims to achieve the perfect rule of law will fail to generate that effect, however. Importantly, we also see that opponents to further reform are not necessarily supporters of a return to the pre-reform stage.

Not surprisingly, the effect of marketization on the probability of reform, as shown so far, is positive. The discussion of the effect of corruption has demonstrated, however, that policies aiming at promoting reform will create intermediate results that could necessitate an adjustment. Reform supporting policies therefore need to be dynamic and path-dependent.

However, the introduction of a degree of coordination through the market has a multitude of other effects. We have discussed the CRE for bureaucrats but focused mainly on officials in general. State owned enterprises, too, can be seen as a special form of the bureaucracy. They are a part of the administration that produces goods and services on behalf of the state. As a consequence of marketization, these enterprises experience competition and a hardening of the hitherto soft budget constraint.³⁸ Which effects will this have on the CRE?

Given the fact that most North Koreans are employed by the state, be they in agriculture, industry, or services, these effects will be of a significant scale for the overall value of the CRE. The experience of transformation from socialist societies in Eastern Europe and East Germany suggests that a dynamic minority will immediately be able to use the new freedom to their advantage, while a majority will quickly come to miss the security of a socialist work environment, in particular because of the threat of unemployment and growing

38. A situation when economic subjects are confident to be able to spend more than they earn thanks to subsidies by the state or other external sources. Kornai, *The Soft Budget Constraint*, op. cit.

inequality.³⁹ They will become reform-averse. In Eastern Europe, this effect occurred suddenly and, notably, after reforms, though not strong enough to undo them. In North Korea, we face a situation where systemic reforms have not yet taken place. Reforms could thus be delayed or even prevented in North Korea as a result of effects that had no significant post-reform impact in Eastern Europe. This is important to consider for comparative studies.

If the fate of a firm and of its employees and leaders becomes closer connected to their economic efficiency, their perception of a net gain or a net loss from such a change will be closely connected to the economic success or failure of their enterprise. A failure will increase the number of reform opponents, while success will increase the number of reform supporters:

- EC_4 (failure): $\Delta R = [X_S \cdot P_S] - [X_N (+) \cdot P_N] = (-)$
- EC_5 (success): $\Delta R = [X_S (+) \cdot P_S] - [X_N \cdot P_N] = (+)$

This applies to all currently ongoing actions directed at new forms of ownership and coordination. Under Kim Jong-un's rule, such actions include the June 28 measures in agriculture, the reported assignment of more freedoms to individual enterprises, the unprecedented announcement of the creation of 13 new special economic zones in 2013 and an additional six new zones in 2014.⁴⁰ The latter have, unlike the previous ones in or around Rasŏn, Mt. Kŭngang, Kaesŏng, and Sinŭiju, not been primarily designed for interaction with foreigners. Rather, they seem to be insulated experimental fields to test the effects of a higher degree of marketization.

The implications of this observation for policy makers are manifest. The conclusion that "success breeds success"⁴¹ applies to marketiza-

39. Gerhard Ritter, *Der Preis der Deutschen Einheit: Die Wiedervereinigung und die Krise des Sozialstaates* (Munich: C. H. Beck, 2007).

40. Andray Abrahamian and Curtis Melvin, *North Korea's Special Economic Zones: Plans vs. Progress*, 38North, 2015, <<http://38north.org/wp-content/uploads/2015/11/38-North-SEZ-Plans-v-Progress-112315.pdf>> (accessed January 10, 2016).

tion in North Korea, too. This renders support to initiatives like the Sunshine policy that intended to actively foster a tangible success of marketization (EC_5). It also challenges the effectiveness of measures that lead to a failure (EC_4), such as economic sanctions.

Military Policy

The main events in this category include the allocation of funds to the military, the positioning of the military in society and ideology, and the use of the military. The latter includes armed incidents like the exchange of gunfire in the West Sea or at the DMZ, and the various tests of nuclear devices and rockets (or ballistic missiles, depending on perspective). During the leadership of Kim Jong-un, half of all North Korean nuclear tests have been conducted (2013 and 2016), and a number of missile tests of various kinds have taken place, including the successful launch of satellites in December 2012 and in February 2016.

For this paper, we focus only on these tests, and we treat them in an abstract form as a single action. Their impact on the CRE is not entirely clear. From an economic perspective, the military uses financial and human resources unproductively and thus reduces the amount of resources that can be distributed by the state to increase the gains from the current system. This should lead to a smaller G_N and, *ceteris paribus*, based on inequality (5.1), to a reduced X_N and a growing R .

- EM_1 (unproductive use of resources):

$$\Delta R = [X_S \cdot P_S] - [X_N (-) \cdot P_N] = (+)$$

On the other hand, the military is an instrument of state power. Investment of resources increases the power of the supporters of the current system:

41. Gebhard Flaig and Manfred Stadler, "Success Breeds Success: The Dynamics of the Innovation Process," *Empirical Economics* 19 (1994), pp. 55-68.

- EM_2 (increased state power):

$$\Delta R = [X_S \cdot P_S] - [X_N \cdot P_N (+)] = (-)$$

The military is also a huge employer in North Korea, with a manpower of an estimated one million or more.⁴² Investment of funds into the military and the allocation of political capital to the military by praising its important role in society will therefore strengthen the number of beneficiaries of the current system and thus of X_N :

- EM_3 (more/stable employment):

$$\Delta R = [X_S \cdot P_S] - [X_N (+) \cdot P_N] = (-)$$

Last and emphatically not least, the military is a source of national pride. It has been argued that the nuclear weapons program is one of the few big successes that the leadership can present to its people; hence, it would be unlikely to give those weapons up as long as no substitutes for this source of legitimacy can be found.⁴³ From a propagandistic perspective, events like the various tests increase the perceived gain from the current system and thus increase X_N :

- EM_4 (pride): $\Delta R = [X_S \cdot P_S] - [X_N (+) \cdot P_N] = (-)$

We are unable to quantify these four effects, and therefore do not know whether the sum of these effects will be positive or negative. However, we can draw two important conclusions:

First, three of the four effects are negative. Government spending on the military, including the nuclear and missile program, reduces the probability of reform in the current system in at least three ways. This resource allocation is thus a rational decision from the perspective of the leadership and is likely to be continued as long as the

42. "World's Largest Armies," *Global Security*, <<http://www.globalsecurity.org/military/world/armies.htm>> (accessed December 27, 2015).

43. Kyle Mizokami, "Why North Korea is Betting Big on Nuclear Weapons," *The Week*, January 8, 2016, <<http://theweek.com/articles/597768/why-north-korea-betting-big-nuclear-weapons>> (accessed January 10, 2016).

regime opposes reforms.

Secondly, the sum of these four effects of military spending on the probability of reform will only be positive if effect EM1 can be strengthened and effects EM2, EM3 and EM4 can be reduced. This has direct implications from a policy perspective. If a measure or a set of measures lead to the effects that (1) more people in North Korea understand that the use of scarce resources for military purposes reduces their welfare; that (2) the utility of the military as an instrument of state power is reduced; that (3) the attractiveness and relevance of the military as an employer is reduced; and that (4) the relevance of the military as a provider of legitimacy to the leadership is reduced, (only) then a positive impact on the probability of reform can be expected.

External Actions

The most relevant action by outsiders seems to be the limitation of interaction in the form of sanctions. These sanctions affect the economy, in particular trade, investment, finance or access to technology. They also concern people-to-people contacts, for example through travel bans on individuals. Among the economic sanctions, refusal to import or export certain products from/to North Korea are most widely known.

The second external action we will look at in this category is tourism. It is a special form of trade and involves a physical movement of the clients to the place where the service is provided. Since people are centrally involved, it includes a high level of direct and indirect people-to-people exchange and interaction, e.g. through direct communication with locals including guides or hotel staff, but also by being seen by locals from a distance.

As with the other fields, sanctions and tourism are only two out of many actual or possible external actions. They are examples to demonstrate how the CRE can be affected by outsiders.

The effect of sanctions has been debated extensively in the academic literature. The leading study in this field summarizes decades of

experience and concludes with a list of best practices. They include the lesson that sanctions will most likely be successful if they are applied against “friends”; not against autocratic regimes; massive (not gradual); and unilateral rather than multilateral.⁴⁴ This helps to understand why sanctions have so far not been able to cause a regime change in North Korea or to stop its nuclear program. But how do sanctions affect the CRE?

First, they reduce the income of the regime, which has less to redistribute and thus faces a reduction in the number of X_N and also in their power P_N . This is the classical argument in favor of sanctions against North Korea, including bans on the sale of luxury items.

- EEx_1 (reduced state income):

$$\Delta R = [X_S \cdot P_S] - [X_N (-) \cdot P_N (-)] = (+)$$

However, there is also the “rally round the flag” phenomenon, when the ideological position of the government is strengthened in a situation that can easily look like an external attack. This would have the adverse effect compared to EEx_1 : the number and power of regime supporters will grow, while supporters of changes will remain silent lest they appear to be unpatriotic.

- EEx_2 (rally round the flag):

$$\Delta R = [X_S (-) \cdot P_S (-)] - [X_N (+) \cdot P_N (+)] = (-)$$

What will be the effect on the CRE if sanctions affect the “people”; for example, what if the import of fertilizer or consumer goods is prevented and/or the sale of anything that can earn the regime hard currency (which could then be used for food imports) is curtailed? The North Koreans might perceive the resulting shortage as a loss from maintaining the current system L_N and hope for gains from a reformed system G_R . Both would reduce X_N .

44. Gary Clyde Hufbauer, Jeffrey J. Schott, Kimberly Ann Elliott, and Barbara Oegg, *Economic Sanctions Reconsidered* (Washington, D.C.: Peterson Institute, 2007).

- $EEEx_3$ (shortage): $\Delta R = [X_S \cdot P_S] - [X_N (-) \cdot P_N] = (+)$

However, a different effect is also possible. If trade is reduced as described above, especially if this limitation lasts for a considerable period of time, the positive effects of trade will be forgotten, and measures to cope with this international isolation will be found. In the end, the perceived losses L_N from not reforming will be smaller, and the perceived gains G_N from reform will be reduced, leading to an increased X_N .

- $EEEx_4$ (adjustment): $\Delta R = [X_S \cdot P_S] - [X_N (+) \cdot P_N] = (-)$

If we combine effects $EEEx_1$ and $EEEx_4$, we get no clear result. Effects $EEEx_1$ and $EEEx_2$ might offset each other. Effect $EEEx_3$ becomes decisive. It will, however, only work if the people identify the current system as the reason for the sanctions and the resulting losses, and if they believe that a new system will eliminate this problem and generate better opportunities. We have no evidence thus far that this is a broadly accepted position in North Korea.⁴⁵ The CRE thus supports the pessimistic notion about the effectiveness of sanctions that are applied over a long period of time.

The effect of tourism is not as extensively debated as that of sanctions, but it seems to be of a similarly emotional and moral nature. Should one travel to North Korea or not? Those who travel argue that they provide the North Koreans with a rare window to the outside world. Those who oppose travel argue that such visits bolster the reputation of the regime, and that the money spent as a tourists will be used to support the regime and finance its nuclear program.

We can write both effects from the CRE perspective. Interacting with North Koreans, confronting them with our ideas on life matters

45. Observers conclude that there is no organized sizeable opposition in North Korea so far, which coincides with the author's observations on the ground. See "World Report 2015: North Korea," *Human Rights Watch*, <<https://www.hrw.org/world-report/2015/country-chapters/north-korea>> (date accessed January 10, 2016).

both major and mundane, showing them our material affluence, and our free lifestyles will have deep ideological effects leading to an increase in the number of reform supporters.

- EEx_5 (more information): $\Delta R = [X_S (+) \cdot P_S] - [X_N \cdot P_N] = (+)$

The tourism money going into the state budget will function in the way that we have discussed above regarding other actions that increase the state's revenue. It will increase the number of status quo supporters.

- EEx_6 (increased state income):
 $\Delta R = [X_S \cdot P_S] - [X_N (+) \cdot P_N] = (-)$

We should, however, also consider other effects of bringing money into North Korea. People receive benefit: guides, hotel staff, drivers, souvenir producers and traders, even customs and immigration officers. This effect goes beyond the ideological EEx_5 . They also benefit economically, either through tips, through income opportunities, or even through corruption. This increases their monetary purchasing power in a way that is independent of the direct influence of the state. Their perceived gains from expanding tourism will grow while the economic power of the state will be reduced.

- EEx_7 (private income):
 $\Delta R = [X_S (+) \cdot P_S (+)] - [X_N \cdot P_N (-)] = (+)$

Due to our inability to quantify single effects, a decisive statement on the balance of tourism-related effects is not possible. The CRE nevertheless helps us to more systematically evaluate the effects of tourism as well as of other actions that could be generalized as "engagement."

Conclusion

The application of the CRE model to the tenure of Kim Jong-un since late 2011 shows that various actions have taken place with the effect of either decreasing or increasing the likeliness of substantial, deep and far-reaching reforms in North Korea. This corresponds with the common qualitative assessment of reality: North Korea has neither returned to the pre-1990 status quo, nor has it yet entered a full-fledged reform phase like China or Vietnam in the 1980s, despite many instances of change from below that received an ex-post authorization by the state.

Thanks to the CRE, we understand this more systematically and in more detail. If we take a comprehensive look at the 23 effects discussed in this article, we find that the number of negative (12) and positive (11) effects is rather balanced. We neither claim that these are all possible effects, nor are we able to quantify them. We do, however, believe that the evidence for the CRE model as presented here provides a realistic and sober picture of a process that is often nontransparent, contradictory, and subject to ideologically biased interpretation.

We have focused on relatively recent actions, but also strongly suggest that the CRE model will yield interesting results if applied on past events, such as the phase lasting from the first nuclear standoff in 1993 until the end of the famine in 1997, or the early reform period of 1998 to 2005. The CRE can also explore why single actions, such as the Sunshine policy or United Nations Security Council resolutions, have not produced the expected results.

Perhaps most importantly, however, the CRE can help to better estimate the impact of future policies on the probability of reforms. We have shown that one action can have multiple and sometimes opposing effects and that these effects are often path-dependent. Any action that increases X_S or P_S by way of influencing at least one of the four outcome-related variables G_R , L_R , G_N , or L_N will lead to a higher probability of reform. Likewise, any action that increases X_N or P_N will reduce the chances for reform.

Based on our analysis of the limited number of actions discussed

in this article, it seems fair to suggest that under certain conditions privatization, marketization, and even corruption will lead to a positive ΔR . On the other hand, sanctions and other forms of pressure seem to make ΔR negative. This is not necessarily counterintuitive, since the goal of these actions is regime change, not reform.

Among the many path-dependent variables is the power of the leader. As long as he feels threatened, he will use his power to prevent any change that could become potentially destabilizing for the current system. However, if he perceives his hold on power to be solid and his position to be safe from domestic and external challenges, he will focus on ways to make such a situation sustainable. As we have shown, this will lead to a need to increase the net benefits of the majority of $X \cdot P$. As soon as this majority becomes supporters of reforms either by an isolated or combined increase in X_S and in P_S , the leader will follow the examples of China and Vietnam, and move from being an opponent of reform to one of its most powerful and crucial supporters.

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