



Exploring international linkages using generalised connectedness measures: The case of Korea[☆]



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ABSTRACT

Korea is a textbook example of a small open economy which is susceptible to conditions overseas but cannot affect them itself. Policymakers in Korea would therefore naturally benefit from an enriched understanding of the connections that exist between the Korean and global economies. We provide a detailed summary of these linkages using the generalised connectedness methodology introduced by Greenwood-Nimmo et al. (2015). Among our principal findings is the observation that domestic conditions are only generally important in the short to medium term, with overseas conditions exerting a dominant influence on Korea's economic prospects in the long run. The economy which exerts the strongest effect on Korea is the US, with a considerable role also played by global energy markets. Furthermore, we find that the global financial crisis is associated with greater connectedness of the Korean economy with advanced economies and its reduced connectedness with emerging economies.

1. Introduction

Recent decades have seen the development of deep and complex international linkages between economies and markets throughout the globe. Arguably, much of this change has been rooted in deregulation and liberalisation, spatial specialisation in production and a succession of revolutionary advances in information and communications technologies. As a result, the economies of the world are now more intricately interconnected than they have ever been. On one hand, such an interconnected system promotes shared prosperity. On the other, it means that shocks can spread rapidly and forcefully through the global economic and financial system in a way that would not have been possible in the past. As such, the study of open economy macro and financial economics has gained a fresh impetus, at the heart of which is interest in modelling the connections that link entities in the global economy.

Due to its economic and political history in recent decades, Korea is likely to exhibit strong connections to many of the World's dominant markets, notably the US, EU, Japan and China. Moreover, as became apparent during the Asian banking crisis, Korea is strongly connected to its regional peers. It therefore provides an excellent example of a small open economy which will be subject to a variety of foreign shocks but which is unlikely to transmit shocks beyond countries in its immediate vicinity. Moreover, given the gradual shift in prominence among the major global powers, it is reasonable to expect that the connectedness of the Korean economy

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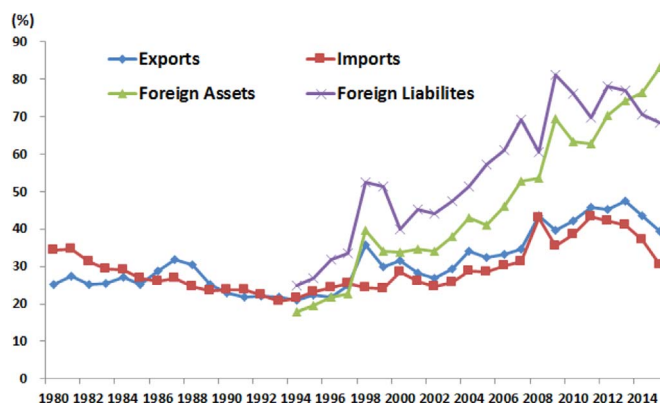


Fig. 1. Economic Openness in Korea (expressed as a percentage of GDP) Source: Bank of Korea, ECOS.

may exhibit considerable and economically important time-variation. Indeed, Fig. 1 reveals that trade relative to GDP has steadily increased between 1980 and 2015, while financial linkages measured by holdings of foreign financial assets and liabilities have increased rapidly over the same period, and especially since the 1997 Asian financial crisis.

In light of such trends, there is an increasingly pressing need to explicitly model the nature and extent of global interlinkages and to refine our understanding of the channels through which shocks are propagated in the global economic and financial system. Consequently, academic economists and practitioners alike are increasingly stressing the importance of the quantifying global connectedness to inform policymaking and risk management activities at both the national and supra-national levels. Indeed, as noted by Pesaran and Smith (2006), “[i]nternational economic interdependence means that national economic issues have to be considered from a global perspective.” In the absence of a proper understanding of these international forces, policymakers are poorly placed to cope with global shocks and crises, a lesson that was emphatically underscored by the 2007–8 Global Financial Crisis and the ensuing European Debt Crisis.

As international linkages become stronger and more diverse, overseas conditions will naturally come to play an increasingly important role in sovereign policy formulation. However, the prevailing consensus regarding the conduct of stabilisation policy emphasises the use of monetary policy to guide the economy toward a desired equilibrium via manipulation of the nominal overnight interest rate in an optimal manner in light of selected *domestic* indicators. Following the seminal work of Taylor (1993), the most widely used indicators to be found in the literature are the rate of price-level inflation and the output gap. While these variables will indirectly convey some information about overseas conditions, the question of how one should directly account for the influence of foreign variables on domestic policy remains open.

We approach this issue using the Generalised Connectedness Measures (GCMs) introduced by Greenwood-Nimmo, Nguyen, and Shin (2015), (GNS), which represent a generalisation of the connectedness methodology developed by Diebold and Yilmaz (2009, 2014). The key feature of this methodology is that it is “simple and intuitive, yet rigorous and replicable” (Diebold and Yilmaz, 2009, p. 158). The essence of the GCM methodology is to compute and cross-tabulate forecast error variance decompositions for a dynamic multivariate model in order to construct a weighted directional network that may be used to quantify spillover effects between entities in the model. The key innovation of GNS (2015) is to extend the simple connectedness methodology of Diebold and Yilmaz (DY) to the context of global VAR models, thereby creating a powerful tool for the dynamic analysis of global interlinkages.

The GCM framework generalises the DY approach in two critically important ways. Firstly, GCMs preserve information losslessly across multiple horizons. Secondly, they are robust to both variable re-ordering and aggregation. These features are of central importance when measuring connectedness in a truly dynamic fashion in a multi-country multi-variable framework. GNS (2015) highlight a variety of important features of the GCM framework, including their ease of computation using standard software solutions, their transparency and ease of replication, their model-independent nature which accommodates both structural and reduced form applications and their straightforward and intuitive interpretation which does not require the audience to be well acquainted with anything but basic economic concepts. The GCM approach therefore represents a natural and highly adaptable framework for the analysis of international linkages, particularly where one intends that the results should be accessible to non-specialist audiences.

The starting point for our analysis is the 26 country/176 variable GNS GVAR model developed by GNS (2012a). To establish a baseline, we estimate the model over the period 1980q2–2007q2 and then compute GCMs using the estimated coefficients and covariance matrices. We refer to these benchmark GCMs as our *full sample* results, and interpret them as a general representation of the average connectedness of the Korean economy over the estimation period. Among our principal findings is the observation that domestic conditions are only generally important in the short to medium term, with overseas conditions exerting a dominant influence on Korea's economic prospects in the long run. Furthermore, we find that the economy which exerts the strongest effect on Korea is the US, with a considerable role also played by global energy markets.

We then conduct recursive estimation starting with 1980q2–2005q2 and ending with 1980q2–2015q1. This allows us to trace how the international linkages of the Korean economy evolved during the Great Recession. Interestingly, we find that the GFC is associated with greater connectedness of the Korean economy with advanced economies and its reduced connectedness with

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