

Volume 8 • Issue 9  
May 2016

SPP Communiqués are brief articles that deal with a singular public policy issue and are intended to provide the reader with a focused, concise critical analysis of a specific policy issue.

Copyright © 2016 by The School of Public Policy.

All rights reserved. No part of this publication may be reproduced in any manner whatsoever without written permission except in the case of brief passages quoted in critical articles and reviews.

The University of Calgary is home to scholars in 16 faculties (offering more than 80 academic programs) and 36 Research Institutes and Centres including *The School of Public Policy*. Founded by Jack Mintz, President's Fellow, and supported by more than 100 academics and researchers, the work of The School of Public Policy and its students contributes to a more meaningful and informed public debate on fiscal, social, energy, environmental and international issues to improve Canada's and Alberta's economic and social performance.

## MACROPRUDENTIAL POLICY: A SUMMARY\*

Mahdi Ebrahimi Kahou<sup>†</sup> and Alfred Lehar<sup>‡</sup>

### SUMMARY

The 2007 global financial crisis brought sharply into focus the need for macroprudential policy as a means of controlling systemic financial stability. This has become a focal point for policy-makers and numerous central banks, including the Bank of Canada, but it has its drawbacks, particularly here in Canada.

As a counterbalance to microprudential policy, the idea of a macroprudential outlook reaches beyond the notion that as long as every banking institution is healthy, financial stability is assured. Macroprudential policy recognizes that all those financial institutions are linked, and that stability at the individual level may translate to fragility and uncertainty at the macro level.

There are two approaches to macroprudential policy, and both come with downsides. One approach examines the network factor, in which banks are linked through their inter-connected financial transactions. A domino effect can thus be created; when one bank defaults, it causes a chain reaction down the line, creating instability in other banks in the network. The extent of this contagion of instability can be clearly observed through this model; unfortunately, it requires the use of detailed information typically available only to a limited circle of bank supervisors.

The second approach gleans information from bank stock prices in a poorly performing market. This information is easily available and accessed, but

\* We thank Norma Nielson, Steven Weimer, and participants at The School of Public Policy Roundtable 2015 and the Global Risk Institute for valuable input, and The School of Public Policy at the University of Calgary for financial support.

<sup>†</sup> Haskayne School of Business, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4.  
Email: mebrahim@ucalgary.ca

<sup>‡</sup> Haskayne School of Business, University of Calgary, 2500 University Drive NW, Calgary, Alberta, Canada T2N 1N4.  
Email: alehar@ucalgary.ca

the downside is the lack of clear understanding on how exactly these shocks travel through the complex links of the global banking system.

Canada's banking system is small and has only six major banks. However, it is important to understand how they are interconnected and how each individual bank can contribute to overall risk. Not only do banks need to be sufficiently capitalized in the normal business cycle, but it may be worthwhile for the sake of overall financial stability to create mechanisms, as regulators in some countries are doing, that require banks to hold more capital in good economic times so that they can use it as a buffer in case of a downturn.

Another important macroprudential tool is to identify how much each bank contributes to systemic risk. This would entail identifying the banks that pose a greater threat to stability and having them hold extra capital. Assigning proper capital requirements is, however, not as straightforward as it may seem as the risk of the banking system changes when capital requirements change. One study has shown that when properly done such a requirement can reduce by one-quarter the probability of a financial crisis.

Implementing macroprudential policy in Canada faces some challenges. With both housing prices and the level of Canadians' personal debt high, sudden corrections to the financial system can create problems. Also, the interconnections between Canadian and foreign banks could result in the former being much more greatly influenced by financial-crisis spillover from the latter, something Canada generally avoided during the 2007 economic meltdown.

There's no consensus as yet on the objectives of macroprudential policy. However, it is a necessary complement to microprudential policy and provides a means of managing systemic risk with the goal of greater global financial stability.

Volume 8 • Issue 9  
May 2016

SPP Communiqués are brief articles that deal with a singular public policy issue and are intended to provide the reader with a focused, concise critical analysis of a specific policy issue.

Copyright © 2016 by The School of Public Policy.

All rights reserved. No part of this publication may be reproduced in any manner whatsoever without written permission except in the case of brief passages quoted in critical articles and reviews.

The University of Calgary is home to scholars in 16 faculties (offering more than 80 academic programs) and 36 Research Institutes and Centres including *The School of Public Policy*. Founded by Jack Mintz, President's Fellow, and supported by more than 100 academics and researchers, the work of The School of Public Policy and its students contributes to a more meaningful and informed public debate on fiscal, social, energy, environmental and international issues to improve Canada's and Alberta's economic and social performance.

## POLITIQUE MACROPRUDENTIELLE : UN SOMMAIRE\*

Mahdi Ebrahimi Kahou<sup>†</sup> and Alfred Lehar<sup>‡</sup>

### SOMMAIRE

La crise financière mondiale de 2007 a fait clairement ressortir la nécessité d'une politique macroprudentielle comme moyen de contrôler la stabilité financière systémique. Cette stratégie est devenue un point de mire pour les responsables des politiques et de nombreuses banques centrales, dont la Banque du Canada, mais elle comporte des inconvénients, particulièrement ici au Canada.

Comme contrepoids à la politique microprudentielle, l'idée d'une perspective macroprudentielle va au-delà de la notion que tant que tous les établissements bancaires sont en bonne santé, la stabilité financière est assurée. La politique macroprudentielle reconnaît que toutes les institutions financières sont reliées et que la stabilité au niveau individuel peut se traduire en fragilité et en instabilité à l'échelon macroéconomique.

Il existe deux approches de la politique macroprudentielle, toutes deux ayant leurs désavantages. Une approche consiste à examiner le facteur réseau, selon lequel les banques sont reliées par leurs opérations financières interconnectées. Un effet domino peut ainsi être déclenché. Lorsqu'une banque manque à ses engagements, cela provoque une réaction en chaîne en aval, créant de l'instabilité dans d'autres banques du réseau. L'étendue de la contagion de cette instabilité peut être clairement observée grâce à ce modèle. Malheureusement, cela demande l'utilisation d'informations

\* Nous remercions Norma Nielson, Steven Weimer et les participants à la Table ronde 2015 de la School of Public Policy, ainsi que le Global Risk Institute pour leur précieuse contribution. Nous remercions également la School of Public Policy de l'Université de Calgary pour son soutien financier.

<sup>†</sup> Haskayne School of Business, Université de Calgary, 2 500 University Drive NW, Calgary, Alberta, Canada T2N 1N4.  
Courriel : mebrahim@ucalgary.ca

<sup>‡</sup> Haskayne School of Business, Université de Calgary, 2 500 University Drive NW, Calgary, Alberta, Canada T2N 1N4.  
Courriel : alehar@ucalgary.ca

détaillées qui ne sont en général à la disposition que d'un cercle limité de responsables de la surveillance des banques.

La deuxième approche consiste à recueillir de l'information à partir des prix des actions bancaires dans un marché peu performant. Cette information est aisément disponible et accessible mais le désavantage en est l'absence d'une compréhension claire de la manière exacte dont ces chocs se répercutent à travers les liaisons complexes du système bancaire mondial.

Le système bancaire du Canada est de taille modeste et ne compte que six grandes banques. Il est toutefois important de comprendre comment elles sont interconnectées et comment chaque banque individuelle peut contribuer au risque d'ensemble. Non seulement les banques ont-elles besoin de disposer de capitaux suffisants au cours du cycle économique normal, il pourrait en outre être avantageux pour la stabilité financière globale de créer des mécanismes, comme les organismes de réglementation le font dans certains pays, exigeant que les banques détiennent davantage de capital en période de prospérité économique, capital qu'elles peuvent utiliser comme marge de sécurité en cas de ralentissement économique.

Un autre outil macroprudentiel important est l'identification de la taille de la contribution de chaque banque au risque systémique. Cela implique d'identifier les banques qui posent un plus grand risque pour la stabilité et de les forcer à détenir des capitaux additionnels. L'assignation d'exigences de capitalisation appropriées n'est toutefois pas aussi simple qu'il pourrait paraître, puisque le risque dans le système bancaire change lorsque les exigences de fonds propres changent. Une étude a démontré que lorsqu'une telle mesure est mise en place de manière adéquate, elle peut réduire du quart la possibilité d'une crise financière.

La mise en œuvre d'une politique macroprudentielle au Canada doit affronter quelques défis. En raison du niveau élevé du prix des logements et de l'endettement personnel des Canadiens, apporter des corrections soudaines au système financier peut créer des problèmes. De plus, les interconnexions entre les banques pourraient faire en sorte que les banques canadiennes soient beaucoup plus influencées par les retombées d'une crise financière dans les banques étrangères, ce que le Canada a en général évité lors de la crise économique de 2007.

Il n'existe pas encore de consensus quant aux objectifs de la politique macroprudentielle. Il s'agit toutefois d'un complément nécessaire à la politique microprudentielle qui constitue un moyen de gérer le risque systémique afin d'assurer une plus grande stabilité financière mondiale.

Banks, as institutions whose operations consist of granting loans and receiving deposits from the public, play a crucial role in the allocation of capital and financial intermediation in the economy. Significant failures in the financial sector create a severe scarcity in the credit supply, and raise the cost of intermediation, which consequently causes unpleasant economic fluctuations. The 2007 global financial crisis highlighted some shortcomings of the regulatory framework at the time, specifically its inability to address the stability of the financial system as a whole. Macroprudential policy, as an attempt to address this concern, has become a mandate for policy-makers and central banks, from the Central Bank of Japan and Thailand to the U.S. Federal Reserve and Bank of Canada.

The origin of the term “macroprudential” can be traced back to the late 1970s. One of the major concerns at that time in financial regulatory circles was the rapid growth of loans to developing countries and their potentially negative impact on financial stability. Macroprudential policy is a complement to microprudential policy for safeguarding financial stability. The logic behind a pure microprudential orientation suffers from severe fallacies of composition. One of the main assumptions of the microprudential framework is that financial stability is ensured as long as every institution is sound. However, due to the interconnection of financial institutions, what may look stable at the individual level can be fragile and unstable at the macro level.

Policy-makers and academics have not yet achieved universal consensus on the objectives of macroprudential policy. However, three growing crucial concerns should be addressed through macroprudential policies: financial stability, systemic risk and procyclicality of the financial sector.

Systemic risk as one of the main factors in assessing financial stability is a fairly new concept in the central banks’ and policy-makers’ circles. However, the attempt to define and evaluate systemic risk in the financial system can be traced back to the mid-1990s. Some of the early definitions of systemic risk focus on a substantial disruption of confidence and information in the banking sector and consequently, in the financial sector. The most recent approaches define systemic risk as the risk of a correlated and simultaneous failure of a significant portion of the banking sector. Today, there are two main approaches of measuring systemic risk:

#### **NETWORK-BASED APPROACH:**

In this class of models, banks are seen as nodes in a network that are linked by inter-bank obligations such as loans or derivatives. When one bank defaults, it cannot honour the obligations to its counterparties in full and some of the linked banks might default as a consequence. The benefit of this class of models is that the extent of contagion as default spreads through the network can be precisely modelled. On the downside, these models require detailed information on the individual banks’ risks and exposures to each other. Such detailed information is usually only available to bank supervisors.

## STOCK-BASED APPROACH:

This approach infers information from stock prices, for example, by examining bank stock returns on days when the whole market performs very poorly. The upside of this approach is the availability of stock price information, and the information and views of all market participants that are priced into the stocks. Its downside is the lack of detailed understanding of how shocks propagate through the system.

The Canadian banking system differs from that of the United States because of its concentration. Almost all assets are concentrated among the big six banks, making them all system-relevant. Nevertheless, in the authors' opinion, some effort should be made to see the Canadian system as a whole and identify the contributions that each of the banks makes to the overall risk.

Macroprudential regulation has to address two dimensions. On the time dimension, regulators have to ensure that banks are adequately capitalized throughout the business cycle. In its 2009 annual report, the Bank for International Settlements defines procyclicality as “the fact that, over time, the dynamics of the financial system and of the real economy reinforce each other, increasing the amplitude of booms and busts and undermining stability in both the financial sector and the real economy.” Banks tend to engage in riskier investments and provide excessive loans in good times, due to under-estimation of risk in the market. By contrast, in bad times they tend to shrink lending, due to over-estimation of risk. In several countries, regulators are experimenting with mechanisms that require banks to hold more capital in boom times that can serve as an extra buffer in a downturn.

In the cross-sectional dimension of macroprudential regulations, capital has to be allocated across the banking system, such that the banks that pose a greater threat to financial stability hold more capital. Identifying system-relevant banks and forcing them to hold more capital than other banks is one mechanism to mitigate systemic risk. One important consideration in this context is that the risk of the system changes once capital gets reallocated in the banking system. When system-relevant banks are forced to hold more capital, systemic risk changes and the risk contributions of individual banks change. New banks might consequently emerge as being system-relevant. In a 2012 study for the large Canadian banks, Gauthier, Lehar and Souissi found that such macroprudential capital requirements can differ substantially from a simpler one-shot identification of system-relevant banks. They also document that macroprudential capital requirements can differ as much as 25 per cent from observed capital levels and have the potential to reduce the probability of a financial crisis by about one-quarter.

We see two challenges for macroprudential stability in Canada. First, housing prices and Canadians' personal debt levels are high. Any sudden corrections might pose a challenge for the financial system. In our opinion, policy-makers should continue to address this time-series aspect of systemic risk. Second, we believe that spillovers from outside of Canada can pose a threat to the banking system. While the Canadian banking system was not severely implicated in the recent financial crisis, stronger linkages may pose a larger threat to Canadian financial stability in the future.



# THE SCHOOL OF PUBLIC POLICY

## About the Authors

**Mahdi Ebrahimi Kahou** is a PhD student in Finance at the Haskayne School of Business. He received his BSc in Physics and Astronomy from Sharif University of Technology, Tehran, Iran. He then moved to Canada and obtained his MSc in Mathematical Physics and Quantum Information from the University of Calgary, Institute for Quantum Science and Technology. During his MSc he worked on developing an efficient quantum search algorithm with elementary particles. He joined the Haskayne School of Business in 2013. He is currently working on systemic risk and the role of connectivity of financial institutions in creating and exacerbating financial crises. He is also interested in developing theoretical frameworks of banking regulations that can enhance the stability of the financial system.

**Alfred Lehar** is assistant professor in the finance area. He has been teaching at the Haskayne School of Business since 2005. He received an undergraduate degree and a PhD from the University of Vienna. Prior to joining Haskayne, Alfred held positions at the University of Vienna and the University of British Columbia. Alfred is currently researching under what conditions renegotiations can facilitate a private sector workout of a financial crisis. He also works on how information produced by financial markets can be optimally used in bank regulation. In his previous research, Alfred developed several methods on how to measure the probability of a financial crisis, analyzed conflicts of interest for financial Analysts and looked at the empirical fit of alternative option pricing models. Alfred's work has been published in *Management Science*, the *Journal of Financial Intermediation*, the *Journal of Banking and Finance* and the *Review of Finance*.