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Ce bulletin mensuel présente les publications les plus récentes des économistes de la Banque. Le rapport inclut des études parues dans des publications externes et les documents de travail du personnel publiés sur le site Web de la Banque du Canada.

PUBLICATIONS

Dans la presse

Jón Daníelsson & Robert Macrae & Andreas Uthemann, "Artificial Intelligence and Systemic Risk", Journal of Banking and Finance, Vol 140(SI): 9-53, juillet 2022

Julia Schmidt & Walter Steingress, "No double standards: Quantifying the impact of standard harmonization on trade", Journal of International Economics, Vol 137, juillet 2022

Bulent Guler & Yasin Kürşat Önder & Temel Taskin, "Hidden Debt", AEA Papers and Proceedings, Vol 112(1): 536-540, mai 2022

À paraître

Seyed Mohammadreza Davoodalhosseini, "Optimal Taxation in Asset Markets with Adverse Selection", European Economic Review

Reinhard Ellwanger & Stephen Snudden, "Futures prices are useful predictors of the spot price of crude oil", Energy Journal

DOCUMENTS DE TRAVAIL DU PERSONNEL

Radoslav Raykov & Consuelo Silva-Buston, "Asymmetric Systemic Risk", Document de travail du personnel de la Banque du Canada 2022-19

Michelle Alexopoulos & Xinfen Han & Oleksiy Kryvtsov & Xu Zhang, "More Than Words: Fed Chairs' Communication During Congressional Testimonies", Document de travail du personnel de la Banque du Canada 2022-20

Ming Zeng & Guihai Zhao, "Expectation-Driven Term Structure of Equity and Bond Yields", Document de travail du personnel de la Banque du Canada 2022-21

Erhao Xie, "Nonparametric Identification of Incomplete Information Discrete Games with Non-equilibrium Behaviors", Document de travail du personnel de la Banque du Canada 2022-22

Anneke Kosse & Zhentong Lu, "Transmission of Cyber Risk Through the Canadian Wholesale Payment System", Document de travail du personnel de la Banque du Canada 2022-23

Pablo Ottonello & Wenting Song, "Financial Intermediaries and the Macroeconomy: Evidence from a High-Frequency Identification", Document de travail du personnel de la Banque du Canada 2022-24

DOCUMENTS D'ANALYSE DU PERSONNEL

Heng Chen & Walter Engert & Kim Huynh & Daneal O'Habib, "Identifying Financially Remote First Nations Reserves", Document d'analyse du personnel de la Banque du Canada 2022-11

Tony Chernis & Taylor Webley, "Nowcasting Canadian GDP with Density Combinations", Document d'analyse du personnel de la Banque du Canada 2022-12

RÉSUMÉS

Artificial intelligence and systemic risk

Artificial intelligence (AI) is rapidly changing how the financial system is operated, taking over core functions for both cost savings and operational efficiency reasons. AI will assist both risk managers and the financial authorities. However, it can destabilize the financial system, creating new tail risks and amplifying existing ones due to procyclicality, unknown-unknowns, the need for trust, and optimization against the system.

No double standards: Quantifying the impact of standard harmonization on trade

This paper quantifies a novel channel that contributes to greater trade integration: the release of harmonized, voluntary product standards. Standards define product characteristics that ensure compatibility, quality and consistency. Harmonized standards unify these characteristics across countries and reduce country-specific adaption costs. We create a novel database on cross-country standards and show that harmonized standards have contributed up to 13% of the growth in global trade. We build a heterogeneous firm model where harmonized standards generate scale effects and induce firms to adopt the standard. Firm-level evidence shows that only the largest firms in the top range of the size-distribution increase their export sales. These firms benefit from higher demand, charge higher prices and sell larger volumes.

Hidden Debt

We study the role of transparency in debt and default dynamics in a quantitative sovereign default model augmented with asymmetric information. We assume that the sovereign debt portfolio is not transparent and part of the debt is not observable to lenders. The quantitative model is calibrated to the Bolivian economy and matches its long-term and business cycle properties. The quantitative results show that when the government moves to a transparent reporting regime, bond prices improve and the sovereign debt portfolio shifts toward noncontingent debt with an increase in overall debt level. However, higher debt increases default frequency and reduces welfare.

Optimal Taxation in Asset Markets with Adverse Selection

Constrained efficiency is characterized in an asset market, subject to search frictions, where sellers are privately informed about the type of their asset. The type determines the opportunity cost of the asset for sellers and the quality of the asset for buyers. The constrained efficient allocation can be implemented using a sales tax schedule. The role of these taxes is to redistribute resources between different types of sellers to relax incentive constraints. The optimal tax schedule strictly increases welfare compared with the laissezfaire equilibrium, can sometimes lead to an allocation that Pareto dominates the equilibrium, and can sometimes lead to the first-best allocation (i.e., taxation can correct all inefficiencies caused by adverse selection). The shape of the optimal tax schedule is also investigated. If the quality of assets for buyers is a monotonic function of the sellers' opportunity cost (e.g., more distressed sellers have lower-quality assets), the schedule requires that the trading of low-quality assets be subsidized and trading of high-quality assets be taxed, although the schedule is not necessarily monotone in the quality or price of the assets. Otherwise, trading of some lowquality assets may be taxed and trading of some high-quality assets may be subsidized.

Futures Prices Are Useful Predictors of the Spot Price of Crude Oil

How well do futures prices forecast the spot price of crude oil? Contrary to the established view, futures prices significantly improve upon the accuracy of monthly no-change forecasts. This results from two innovations. First, we document that independent of the construction of futures-based forecasts, longer-horizon futures prices have become better predictors of crude oil spot prices since the mid-2000s. Second, we show that futures curves constructed using end-ofmonth prices instead of average prices can generate large accuracy-improvements for short-horizon forecasts of average prices. These findings are remarkably robust and apply to both WTI and Brent crude oil prices.

Asymmetric Systemic Risk

Bank regulation is based on the premise that risks spill over more easily from large banks to the banking system than vice versa. On the contrary, we document that risk transmission is stronger in the system-to-bank direction. We term this asymmetric systemic risk, measure it with net exposure metrics, and explore the consequences

and channels behind it. We show that banks with positive net exposure to the system had higher default risk during the 2008 crisis, and that bank size and trading activities were the main determinants of this net exposure, which increased default risk through trading income volatility and overall profit volatility. We argue that the current banksupervision objectives can be achieved more efficiently if regulation focuses on reducing such net exposures, rather than buffering the default risks arising from them.

More Than Words: Fed Chairs' Communication During Congressional Testimonies

We measure soft information contained in the congressional testimonies of U.S. Federal Reserve Chairs and analyze its effect on financial markets. Our measures of Fed Chairs' emotions expressed in words, voice and facial expressions are created using machine learning. Increases in the Chair's text-, voice-, or face-emotion indices during these testimonies generally raise the S&P500 index and lower the VIX—indicating that these cues help shape market responses to Fed communications. These effects add up and propagate after the testimony, reaching magnitudes comparable to those after a policy rate cut. Markets respond most to the Chair's emotions expressed about issues related to monetary policy.

Expectation-Driven Term Structure of Equity and Bond Yields

Les résultats de travaux récents sur la structure des taux de rendement des actions et des obligations posent des défis de taille aux modèles existants de détermination des prix d'équilibre des actifs. Cette étude propose un nouveau modèle d'équilibre basé sur les anticipations subjectives pour expliquer les dynamiques historiques conjointes des rendements boursiers et obligataires (et leurs écarts de rendement). Les mouvements de ces rendements sont principalement causés par des anticipations subjectives à l'égard de la croissance des dividendes et du produit intérieur brut (PIB). Dans le cas des droits aux dividendes à court terme, les rendements sont plus volatils parce que l'anticipation de croissance du dividende à court terme retourne à sa moyenne de long terme, moins volatile. La pente procyclique du rendement des actions est due à la pente contracyclique des anticipations de croissance des dividendes. La corrélation entre les rendements des actions et les rendements nominaux des obligations est passée du positif au négatif après la fin des années 1990, en raison essentiellement d'une corrélation plus forte entre la croissance du PIB réel et le taux de croissance réel des

dividendes attendu, et en partie seulement à cause de l'inflation procyclique. Les rendements des strips de dividendes sont prévisibles, mais la capacité prédictive diminue avec l'échéance en raison des erreurs de prévision et révisions prévisibles. Le modèle concorde également avec les données car il produit des ratios cours-dividende persistants et volatils, et une volatilité excessive des rendements.

Nonparametric Identification of Incomplete Information Discrete Games with Non-equilibrium Behaviors

Dans les travaux d'estimation des jeux discrets en information incomplète, les chercheurs formulent généralement deux hypothèses. D'abord, des contraintes sont imposées à la fonction de gains ou à la fonction de distribution des informations privées, ou aux deux à la fois, pour que celles-ci suivent des formes paramétriques. Ensuite, les comportements des joueurs sont considérés comme étant conformes au modèle d'équilibre de Nash bayésien. Dans cette étude, ces deux hypothèses sont écartées conjointement. Le cadre définit la fonction de gains et la fonction de distribution des informations privées de façon non paramétrique. De plus, la croyance de chaque joueur à l'égard des comportements des autres joueurs est modélisée sous la forme d'une fonction non paramétrique. La fonction des croyances peut correspondre à n'importe laquelle des distributions de probabilités qui représentent les ensembles d'actions des autres joueurs. Cette spécification intègre l'hypothèse d'équilibre lorsque la croyance de chaque joueur correspond aux probabilités réelles des choix des autres joueurs. Elle autorise aussi des comportements hors équilibre lorsque les croyances de certains joueurs sont biaisées ou erronées. De ce cadre, notre étude déduit d'abord l'implication vérifiable de la condition d'équilibre. Elle obtient ensuite les résultats d'identification pour la fonction de gains, la fonction des croyances et la fonction de distribution des informations privées.

Transmission of Cyber Risk Through the Canadian Wholesale Payment System

In this paper, we study how the impact of a cyber-attack that paralyzes one or multiple banks' ability to send payments would transmit to other banks through the Canadian wholesale payments system. Based on historical payment data, we simulate a wide range of scenarios and evaluate the total payment disruption in the system. We find that depending on the type and number of banks under

attack, the time of the attack and the design of the payments system, the attack can quickly become systemic and result in a significant loss of liquidity in the system. For instance, a three-hour attack on one bank can in the worst case impair the payments capacity of seven other banks within less than an hour and eventually disrupt 25% of the daily payments value. We also demonstrate that the system-wide impact of an attack can be significantly reduced by contingency plans that enable attacked banks to still send high-value payments. Given the interconnectedness of banks, we conclude that the cyber-resilience of a wholesale payment system strongly depends on the cyber-resilience of its participants and underline the importance of strong sectoral collaboration and coordination.

Financial Intermediaries and the Macroeconomy: Evidence from a High-Frequency Identification

We provide empirical evidence of the causal effects of changes in financial intermediaries' net worth on the aggregate economy. Our strategy identifies financial shocks as high-frequency changes in the market value of intermediaries' net worth in a narrow window around their earnings announcements, based on US tick-by-tick data. Using these shocks, we estimate that news of a 1% decline in intermediaries' net worth leads to a 0.2% to 0.4% decrease in the market value of nonfinancial firms. These effects are more pronounced for firms with high default risk and low liquidity and when the aggregate net worth of intermediaries is low.

Identifying Financially Remote First Nations Reserves

Chen et al. (2021) show that almost one-third of First Nations band offices in Canada are within 1 kilometre (km) of an automated banking machine (ABM) or financial institution (FI) branch and more than half are within 5 km. Further, over three-quarters of band offices are within 20 km of an ABM or FI branch and almost 90% are within 50 km. We focus on 49 First Nations locations that are more than 100 km away from an ABM or FI branch or do not have an identifiable travel route (by road or boat) to an ABM or FI branch. We refer to these First Nations as financially remote. We show that these locations have small populations and limited access to internet and mobile services. As a result, these First Nations have poor access to cash sources and physical delivery of financial services as well as limited access to digital payments and electronic banking.

We also assess the remoteness of these locations according to an alternative method based on measures of agglomeration (community

population) and proximity to other communities. We find that, according to this measure, these 49 financially remote First Nations are generally among the most geographically remote communities in Canada. Further, we show that these First Nations are also among the lowest scoring communities in Canada according to a measure of community well-being based on indicators of educational attainment, labour force activity, income and housing.

The geographical remoteness of these 49 First Nations, their small populations, limited infrastructure and digital services, and relatively low community well-being all likely contribute to their poor access to cash and financial services.

Nowcasting Canadian GDP with Density Combinations

L'élaboration de politiques exige de pouvoir évaluer la situation économique en temps réel, et il est tout aussi important de comprendre les risques entourant ces évaluations. En général, les décideurs reçoivent des prévisions ponctuelles qui ne contiennent pas assez d'information sur les risques. Or, les densités prédictives estiment, pour leur part, toute l'étendue des possibilités. Elles permettent ainsi de quantifier non seulement la situation actuelle de l'économie, mais aussi le degré d'incertitude, les risques extrêmes et la résultante de l'ensemble des risques concernant cette situation. Cette étude s'attache donc à développer le cadre conçu par Chernis et Sekkel (2018), qui visait à produire des prévisions par densité de la croissance du PIB réel canadien pour la période en cours. Nous comparons plusieurs méthodes consistant à combiner les densités prédictives de 98 modèles représentant quatre catégories courantes de modèles de prévision pour la période en cours. Les résultats de ces combinaisons sont ensuite évalués à l'aide d'exercices hors échantillon en temps réel et en temps quasi réel, les simulations en temps réel fondées sur un échantillon restreint faisant ressortir l'importance des révisions de données au regard des prévisions pour la période en cours. Nous démontrons que les densités combinées sont des outils fiables permettant d'évaluer avec justesse la situation économique et les risques pesant sur les perspectives. Nous abordons en particulier les risques présents au début de la pandémie de COVID-19.

ÉVÉNEMENTS À VENIR

***Toutes conférences et activités qui devaient être tenues sur place sont suspendues jusqu'à nouvel ordre. Tous les événements ci-dessous auront lieu en ligne.**

Lorenzo Magnolfi (University of Wisconsin-Madison)
Organisateur: BAP Conférencier
Date: 2 mai 2022

Federico Huneeus (Central Bank of Chile)
Organisateur: FMD FSD/EFR Conférencier
Date: 5 mai 2022

Thomas Le Barbanchon (Bocconi University)
Organisateur: INT CEA/EFR Conférencier
Date: 6 mai 2022

Robert Clark (Queen's University)
Organisateur: BAP Conférencier
Date: 9 mai 2022

Rachel Ngai (London School of Economics)
Organisateur: FMD FSD/EFR Conférencier
Date: 12 mai 2022

Andrea Barbon (University of St. Gallen)
Organisateur: BAP Conférencier
Date: 16 mai 2022

Sherry Wu (Pennsylvania State University)
Organisateur: CEA Conférencier
Date: 18 mai 2022

Javier Suarez (CEMFI)
Organisateur: FMD FSD/EFR Conférencier
Date: 19 mai 2022

David Argente (Pennsylvania State University)
Organisateur: MON Séminaire
Date: 25 mai 2022

Kurt Mitman (Stockholm University)
Organisateur: INT CEA/EFR Conférencier
Date: 27 mai 2022