様　式　Ｃ－１９、Ｆ－１９－１、Ｚ－１９　（共通）

科研費
KAKENHI

科学研究費助成事業　　研究成果報告書

令和　５ 年　６ 月 ２１ 日現在

機関番号：２３９０３
研究種目：基盤研究(C)（一般）
研究期間：2019～2022
課題番号：１９Ｋ０１７５５

研究課題名（和文）Understanding the Gains from Wage Rigidity in a Currency Union with Default Risk: Focusing on the Relationship between Terms of Trade and Fiscal Balance

研究課題名（英文）Understanding the Gains from Wage Rigidity in a Currency Union with Default Risk: Focusing on the Relationship between Terms of Trade and Fiscal Balance

研究代表者
岡野　衛士（OKANO, Eiji）

名古屋市立大学・大学院経済学研究科・教授

研究者番号：２０４０６７１３

交付決定額（研究期間全体）：（直接経費）　　3,200,000円

研究成果の概要（和文）：本研究では動学的確率的一般均衡モデルを用いて交易条件の変化と財政収支に着目して共通通貨圏での賃金硬直性が経済厚生にもたらす関係について分析した。先行研究では本研究と同じく交易条件の変化に着目している一方、財政収支には着目していない。本研究では財政収支の影響を考慮するために先行研究とは異なりモデルに明示的に政府を導入し、さらにBohnルールのような内生的な財政フィードバックルールを組み込むことで分析を行った。分析の結果、先行研究では賃金伸縮性は共通通貨圏において経済厚生を必ずしも高めるものではないことが示されている一方、本研究では賃金伸縮性は経済厚生を多くの場合において高めることを示した。

研究成果の学術的意義や社会的意義
先行研究では共通通貨圏において賃金伸縮性は必ずしも経済厚生を高めることではないと主唱されている。本研究では政府を明示的にモデルに取り込むことで、先行研究とは異なり賃金伸縮性は経済厚生を高めることを示した。金融政策は財政政策と共に考えることでより現実的な政策的含意が得られるとするならば、現実的な政策的含意が得られたという点で本研究の成果は大いに意義があると言える。

研究成果の概要（英文）：This study analyzes how wage rigidity affects social welfare, by exploiting dynamic general equilibrium and focusing on the relationship between changes in the terms of trade and fiscal balance. Even in previous works, similar to this study, how wage rigidity affects social welfare, by exploiting the framework adopted by this study. Although previous works focus on changes in the terms of trade, however, those do focus on fiscal balance. Because of this, how fiscal balance affects the relationship between wage rigidity and social welfare is not considered. To consider this and analyze, unlike those previous works, the model in this study includes government budget constraint with endogenous fiscal feed back rule like Bohn rule explicitly. This study has succeeded to show that wage flexibility enhances social welfare in many cases, although previous works showed that wage flexibility does not necessary enhance social welfare in a currency union.

研究分野：国際金融論

キーワード：賃金硬直性　経済厚生　共通通貨圏

様　式　C－１９、F－１９－１、Z－１９（共通）

１．研究開始当初の背景

Gali and Monacelli (2016, GM) find that (i) the effectiveness of labor cost adjustments on employment is much smaller in a currency union and (ii) an increase in wage flexibility often reduces welfare, more likely so in an economy that is part of a currency union.

Gains from wage flexibility have been discussed since Gali (2013) examined the role of wages in employment determination in John Maynard Keynes' landmark work *The General Theory of Employment, Interest, and Money* (Keynes, 1936) based on New Keynesian models. By interpreting Keynes (1936), he shows that employment does not depend on wage adjustments, and the volatility of wage inflation increases when wages become more flexible in New Keynesian models. In addition, he shows that wage flexibility is not always welfare improving. Gali (2013) casts doubt on researchers' and policy makers' belief that wage flexibility is desirable. Similar to Gali (2013), Bhattarai, Eggertsson and Schoenle (2018) show that more flexible wages often reduce welfare under optimal monetary policy.[i] GM, who provide an important research question for this paper, developed a small open economy model based on Gali and Monacelli (2005) and compared a small open economy adopting a flexible exchange rate or inflation targeting with a small open economy adopting a fixed exchange rate or that is part of a currency union. Then, they show their two findings mentioned above. They extend their baseline model to a medium-scale dynamic stochastic general equilibrium (DSGE) model and show that their two findings are still applicable. More recently, Billi and Gali (2020) show that a zero lower bound (ZLB) constraint on the nominal interest rate generally amplifies the adverse effects of greater wage flexibility on welfare when the central bank follows a conventional Taylor rule. Their finding is consistent with Eggertsson, Ferrero and Raffo (2014) who show that structural reforms that increase competition in labor markets, which coincides with reducing wage rigidity, does not support economic activity in the short run as long as the nominal interest rate hits the ZLB.[ii]

For now, it seems that the idea that wage flexibility does not necessarily improve welfare not only in an economy that is part of a currency union but also in a closed economy is becoming increasingly accepted. However, those previous studies do not consider the interaction between monetary and fiscal policies. Considering this interaction is not trivial. Leeper and Leith¥cite{LeeperLeith16} mention that it is always the joint behavior of monetary and fiscal policies that determines inflation (and stabilizes debt). In addition, Mario Draghi, the then President of the European Central Bank (ECB), made the following remark in his speech in December 2018 (Draghi (2018)):

> But national budgets will never lose their function as the main stabilization tool during crises. In the euro area, around 50% of an unemployment shock is absorbed through the automatic stabilizers in national public budgets, significantly more than in the United States. [...] Yet national fiscal policies also need a complement at the European level.

As long as the previous description remains the ECB's policy stance, how fiscal policy, especially national-level fiscal policy which is viewed as another important stabilization tool, affects a currency union along with monetary policy should be discussed. Indeed, certain researchers have been aware of the importance of considering the interaction between monetary and fiscal policies in a currency union, and introducing an endogenous fiscal policy to analyze monetary policy in a currency union is not novel. Gali and Monacelli (2008) analyzed optimal monetary and fiscal policy and clarified the importance of fiscal policy in a small open economy that is part of a currency union. Ferrero (2009) derived monetary and fiscal policy rules in a currency union that achieved approximate optimal allocation and Okano (2014) showed that there are no additional welfare gains from cooperative monetary and fiscal policy in a currency union even if there are nontradable goods. However, they did not introduce wage rigidity in their models and they did not have any policy implications on whether wage flexibility enhances welfare.

２．研究の目的

Thus, I introduce an endogenous fiscal policy rule similar to the Bohn rule with a government budget constraint, namely, the government financing its deficit by issuing debt and running fiscal surpluses to repay the debt, into the baseline GM model to investigate two findings of GM. First, I develop my baseline model, which is quite similar to the baseline GM model except for the steady-state efficiency. My steady state is distorted because monopolistically competitive power remains, similar to de Paoli (2009) who derived a class of DSGE models assuming a small open economy with a distorted steady state. Using this baseline model (which is referred to as the distorted steady-state model), we compare a small open economy adopting a flexible exchange rate or inflation targeting with a small open economy that is part of a currency union. I replicate GM's two findings using the distorted steady-state model, which means that GM's findings are still applicable even if the steady state is distorted.

３．研究の方法

I introduce an endogenous fiscal policy rule similar to the Bohn rule with a government budget constraint into the distorted steady-state model. I dub the model, the incorporating government budget constraint (IGBC) model. Analogous to GM, I show dynamic responses to a one percent decrease in the tax rate. Even in the IGBC model, the effect of labor cost adjustments on employment is much smaller in a small open economy that is part of a currency union. That is, GM's first finding is still applicable in the IGBC model. Furthermore, I calculate the welfare loss function of a small open economy that is part of a currency union in that model. GM showed that an increase in wage flexibility often reduced welfare in an economy that is part of a currency union. My result is that an increase in wage flexibility almost always reduces welfare loss. However, if wage rigidity is high enough, wage flexibility always reduces welfare loss. Wage rigidity is not necessarily favorable in an economy that is part of a currency union. This finding is almost the opposite of GM's second finding.

The reason for my finding is the introduction of an endogenous fiscal policy rule similar to the Bohn rule to close the IGBC model. The Bohn rule implies that the government secures a fiscal surplus to repay the government debt and has the characteristic of procyclicality. In my setting, the tax is effectively levied on output which is completely identical to employment as long as productivity is unchanged, the tax gap (which is the difference between the tax rate and its steady-state value) is the policy instrument and it varies with changes in the amount of government debt on issue. The tax gap also reacts to employment. The tax gap increases when employment is stagnant to achieve the fiscal surplus necessary to repay the debt (as long as productivity is unchanged). In contrast, the tax gap decreases when employment increases because there is a enough fiscal surplus to repay the debt (as long as productivity is unchanged). Thus, the tax gap is negatively related to employment and there is procyclicality in the Bohn rule. Furthermore, when employment increases sufficiently, the tax gap decreases and works to decrease the marginal cost of production, however, there is also upward pressure on marginal cost from an increase in employment. Thus, while the increase in marginal cost puts upward pressure on domestic price inflation, there is also downward pressure on domestic price inflation through the Bohn rule even if employment increases. The pressure to increase domestic price inflation is reduced through the procyclicality of the Bohn rule.

４．研究成果

While I support GM's first finding even if there is an endogenous fiscal policy rule such as the Bohn rule advocated by Bohn (1998) with a government budget constraint, I cannot necessarily support their second finding as long as there is an endogenous fiscal policy rule such as the Bohn rule with a government budget constraint. At least, an increase in wage flexibility increases welfare in an economy that is part of a currency union as long as wage rigidity is high enough if there is an endogenous fiscal policy rule like the Bohn rule with government budget constraint. There is enough room to discuss how wage flexibility is beneficial in an economy that is part of a currency union.

Reducing the pressure on domestic price inflation through a decrease in the tax gap means that introducing the Bohn rule makes domestic price inflation inelastic with respect to changes in the employment gap. Indeed, introducing the Bohn rule makes the slope of the aggregate supply curve, the so-called New Keynesian Phillips curve (NKPC), flatter implicitly. A flatter NKPC implies that domestic price inflation is inelastic with respect to changes in employment. In other words, employment is elastic with respect to changes in domestic price inflation. As wage rigidity increases, the wage markup decreases and workers increase their hours worked in order to offset the stagnation in the nominal wage in response to a demand shock. Combined with a flatter slope of the NKPC associated with the procyclicality of the Bohn rule, which makes employment more elastic with respect to domestic price inflation, the welfare loss associated with the employment gap fluctuation increases drastically as wage rigidity increases. Thus, an increase in wage rigidity has further negative effects on welfare in the IGBC model.

Importantly, I can replicate GM's two findings even if I slightly modify their setting, whereas I achieve almost opposite results by introducing an endogenous fiscal policy rule such as the Bohn rule with a government budget constraint in a model of a small open economy that is part of a currency union. As long as I use an endogenous fiscal policy rule such as the Bohn rule with a government budget constraint in an economy that is part of a currency union, I cannot replicate completely GM's second finding. Wage flexibility may reduce welfare loss under several assumptions that are not made by GM, and there is a need to discuss how wage flexibility reduces welfare loss in various settings.

参考文献

Bhattarai, Saroj, Gauti B. Eggertsson and Raphael Schoenle (2018), ``Is Increased Price Flexibility Stabilizing? Redux," *Journal of Monetary Economics*, 100, 66--82.

Billi, Roberto M. and Jordi Gali (2020), ``Gains from Wage Flexibility and the Zero Lower Bound," *Oxford Bulletin of Economics and Statistics*, Forthcoming.

Bohn, Henning (1998), ``The Behavior of U.S. Public Debt and Deficits," *Quarterly Journal of Economics*, 113, 949--963.

Draghi, Mario (2018), ``Europe and the Euro 20 Years on," Speech at Laurea Honoris Causa in Economics at the University of Sant'Anna, Pisa, Dec. 15, 2018, https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp181215.en.html

Eggertsson, Gauti B. and Paul Krugman (2012), ``Debt, Deleveraging, and the Liquidity Trap: A Fisher-Minsky-Koo Approach," *Quarterly Journal of Economics*, 127, 1469--1513.

Eggertsson, Gauti B., Andrea Ferrero and Andrea Raffo (2014), ``Can Structural Reforms Help Europe?," *Journal of Monetary Economics*, 61, 2--22.

Ferrero, Andrea (2009), ``Fiscal and Monetary Rules for a Currency Union," *Journal of International Economics*, 77, 1--10.

Gali, Jordi (2013), ``Notes for A New Keynesian Guide to Keynes (I): Wages, Aggregate Demand, and Employment," *Journal of European Economic Association*, 11, 973--1103.

Gali, Jordi and Tommaso Monacelli (2008), ``Optimal Monetary and Fiscal Policy in a Currency Union," *Journal of International Economics*, 76, 116--132.

Gali, Jordi and Tommaso Monacelli (2016), ``Understanding the Gains from Wage Flexibility: The Exchange Rate Connection," *American Economic Review*, 106, 3829--3868.

Keynes, John M. (1936), ``The General Theory of Employment, Interest and Money," *Macmillan*.

Okano, Eiji (2014), ``How Important is Fiscal Policy Cooperation in a Currency Union?," *Journal of Economic Dynamics and Control*, 38, 266--286.

Schmitt-Grohe, Stepanie and Martin Uribe (2016), ``Downward Nominal Rigidity, Currency Pegs, and Involuntary Unemployment," *Journal of Political Economy*, 124, 1466--1514.

---

[i] Their main interest is the effects on price rigidities through their analysis of the effects on wage rigidities.

[ii] Although they do not conduct a welfare analysis, Eggertsson and Krugman (2012) argue that an increase in wage rigidity may help offset the adverse effects of deflationary shocks in an environment with a binding ZLB. Schmitt-Grohe and Uribe (2016) developed a currency union model with downward nominal wage rigidity and showed that optimal capital controls reduce unemployment. However, they did not present explicit findings on how changes in wage rigidity affect welfare

５．主な発表論文等

〔雑誌論文〕　計2件（うち査読付論文　0件／うち国際共著　0件／うちオープンアクセス　2件）

１．著者名 OKANO, Eiji	４．巻 2005
２．論文標題 Understanding the Gains from Wage Flexibility in a Currency Union: The Fiscal Policy Connection	５．発行年 2020年
３．雑誌名 Birkbeck Centre for Applied Macroeconomics Working Paper	６．最初と最後の頁 1-43
掲載論文のDOI（デジタルオブジェクト識別子） なし	査読の有無 無
オープンアクセス オープンアクセスとしている（また、その予定である）	国際共著 －

１．著者名 OKANO, Eiji and Masataka Eguchi	４．巻 1902
２．論文標題 Optimal monetary and fiscal policy rules, welfare gains and exogenous shocks in an economy with default risk	５．発行年 2019年
３．雑誌名 BCAM Working Paper Series	６．最初と最後の頁 1--25
掲載論文のDOI（デジタルオブジェクト識別子） なし	査読の有無 無
オープンアクセス オープンアクセスとしている（また、その予定である）	国際共著 －

〔学会発表〕　計8件（うち招待講演　0件／うち国際学会　3件）

１．発表者名 岡野衛士
２．発表標題 The Effects of Money-financed Fiscal Stimulus in a Small Open Economy
３．学会等名 29th Symposium of the Society for Nonlinear Dynamics & Econometrics（国際学会）
４．発表年 2022年

１．発表者名 岡野衛士
２．発表標題 The Effects of Money-financed Fiscal Stimulus in a Small Open Economy
３．学会等名 日本金融学会中部部会2021年度第2回研究会
４．発表年 2022年

１．発表者名
岡野衛士

２．発表標題
The Effects of Money-financed Fiscal Stimulus in a Small Open Economy

３．学会等名
15th International Conference on Computational and Financial Econometrics（国際学会）

４．発表年
2021年

１．発表者名
岡野衛士

２．発表標題
Understanding the Gains from Wage Flexibility in a Currency Union: The Fiscal Policy Connection

３．学会等名
日本応用経済学会2020年度春季大会

４．発表年
2020年

１．発表者名
岡野衛士

２．発表標題
Understanding the Gains from Wage Flexibility in a Currency Union: The Fiscal Policy Connection

３．学会等名
日本金融学会令和2(2020)年度第2回研究会

４．発表年
2021年

１．発表者名
岡野衛士

２．発表標題
Optimal Monetary and Fiscal Policy Rules, Welfare Gains and Exogenous Shocks in an Economy with Default Risk

３．学会等名
日本金融学会2019年秋季大会

４．発表年
2019年

１．発表者名 岡野衛士
２．発表標題 Optimal Monetary and Fiscal Policy Rules, Welfare Gains and Exogenous Shocks in an Economy with Default Risk
３．学会等名 日本応用経済学会2019年秋季大会
４．発表年 2019年

１．発表者名 OKANO, Eiji
２．発表標題 Understanding the Gains from Wage Rigidity: How Default Risks Work?
３．学会等名 INFINITI Conference on International Finance（国際学会）
４．発表年 2019年

〔図書〕　計0件

〔産業財産権〕

〔その他〕

未公刊論文 https://www.econ.nagoya-cu.ac.jp/~eiji_okano/papers_j.html Birkbeck Center for Applied Macroeconomics http://www.bbk.ac.uk/research/centres/bcam/working-paper-series 未公刊論文 https://www.econ.nagoya-cu.ac.jp/~eiji_okano/papers_j.html

６．研究組織

	氏名 （ローマ字氏名） （研究者番号）	所属研究機関・部局・職 （機関番号）	備考

７．科研費を使用して開催した国際研究集会

〔国際研究集会〕　計0件

８．本研究に関連して実施した国際共同研究の実施状況

共同研究相手国	相手方研究機関