International dimensions of optimal monetary policy: A re-appraisal and new directions, by Corsetti, Dedola and Leduc

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- Although preliminary and incomplete, this seems a very interesting and promising review of the literature on optimal monetary stabilization policies in open economies.

- I like a lot the approach to the problem (introduction is great!), which is seen from an open-economy perspective and not like a simple appendix to closed-economy results.

- In particular, right emphasis and balance on open-economy channels:

  - Terms of trade as a transmission mechanism.

  - International financial markets and role of exchange rate as a shock absorber.

  - Cooperative versus non-cooperative solutions.

First part: workhorse model

- General principle of optimal monetary policy is that there should not be relative-price misalignment. Relative prices should reflect relative costs.

- In a closed economy: common productivity shocks. Therefore price stability, zero inflation.

- In an open economy, additional relative-price adjustments even in a basic model: terms of trade, internal real exchange rate. Principle of optimal monetary policy more complicated.

- Does it exist an open-economy model which has the same implications of a closed-economy model in terms of prescription for guiding optimal monetary policy?

- *As a first step in our study, we draw on the literature to specify a two-country two-good models in which the prescription guiding optimal monetary policy is identical to ones for the benchmark closed-economy model mentioned above: price stability is optimal vis-a-vis efficient shocks, some deviations from price stability are optimal vis-a-vis inefficient shocks (as in e.g. Benigno and Benigno 2005, henceforth BB).*

- But which price level?

Workhorse model:

- Generalization of Benigno and Benigno (JIMF, JME, Macroeconomic Dynamic) with home-bias in consumption and so deviations from PPP. More shocks. (I am not sure generalizations add much)

- One suggestion is to give more details on the log-linear model. (model of exchange-rate determination, Benigno and Benigno, JIMF)

- More details on the solution method at least in the workhorse model. Paper is written for an expert.

- Show more details on LQ cooperative solutions under timeless perspective;

- Show first-order conditions which are useful to get insights into the solution

The first-order condition with respect to $y_{H,t}$, $y^*_{F,t}$ and q_t are

$$\lambda_y^w y_{H,t} = \varphi_{1,t} + (1-n)\theta^{-1} s_c^{-1} \varphi_{3,t}, \tag{1}$$

$$\lambda_y^w y^*_{F,t} = \varphi_{2,t} - n\theta^{-1} s_c^{-1} \varphi_{3,t}, \tag{2}$$

$$\lambda_y^w s_c \theta \psi q_t = \psi \varphi_{1,t} - \psi \varphi_{2,t} - \varphi_{3,t}, \tag{3}$$

for each $t \geq t_0$, while the ones with respect to $\pi_{H,t}$ and $\pi^*_{F,t}$ are

$$\lambda_y^w \sigma s_c^2 \pi_{H,t} = -(\varphi_{1,t} - \varphi_{1,t-1}), \tag{4}$$

$$\lambda_y^w \sigma s_c^2 \pi^*_{F,t} = -(\varphi_{2,t} - \varphi_{2,t-1}), \tag{5}$$

for each $t \geq t_0$.

- When $\bar{\mu} = 1$, the nominal exchange rate follows

$$\ln S_t/\bar{S} = \left(\frac{1}{\sigma} - \frac{s_C}{\theta}\right)\frac{1}{(\rho + \eta s_C)}(\varphi_{2,t} - \varphi_{1,t}) + \frac{\eta}{1 + \theta s_C \eta}[\hat{a}_t - \hat{a}_t^* - (\hat{G}_t - \hat{G}_t^*)].$$

- In the special case when $\theta s_C = \sigma$, the exchange rate should not fluctuate when the economy is perturbed by mark-up shocks. Otherwise, when there are no mark-up shocks then $\varphi_{1,t} = \varphi_{2,t} = 0$ at each time and the exchange rate moves as in the Friedman's argument.

- Non-cooperative loss function. Should show quadratic loss function of the domestic and foreign policymaker

$$
\begin{aligned}
L &= \frac{1}{2}E_{t_0}\sum_{t=t_0}^{\infty}\beta^{t-t_0}[\lambda_{y_h}(\hat{Y}_{H,t}-\tilde{Y}^h_{H,t})^2+\lambda_{y_f}(\hat{Y}^*_{F,t}-\tilde{Y}^h_{F,t})^2+\lambda_q(\hat{T}_t-\tilde{T}^h_t)^2 \\
&\quad +\lambda_{\pi_h}\pi^2_{H,t}+\lambda_{\pi_f}\pi^{*2}_{F,t}]
\end{aligned}
$$

$$
\begin{aligned}
L^* &= \frac{1}{2}E_{t_0}\sum_{t=t_0}^{\infty}\beta^{t-t_0}[\lambda^*_{y_h}(\hat{Y}_{H,t}-\tilde{Y}^f_{H,t})^2+\lambda^*_{y_f}(\hat{Y}^*_{F,t}-\tilde{Y}^f_{F,t})^2+\lambda^*_q(\hat{T}_t-\tilde{T}^f_t)^2 \\
&\quad +\lambda^*_{\pi_h}\pi^2_{H,t}+\lambda^*_{\pi_f}\pi^{*2}_{F,t}]
\end{aligned}
$$

Note that targets might be different from the ones implied by the cooperative loss function.

- There are no gains from cooperation under two special cases. One simple case is when $L = L^* = L^W$.

- When $\theta = 1/\rho$, the cooperative loss function simplifies to a quadratic form that displays only GDP inflation and output targets, since $\psi = 0$, while the loss functions for each country simplify to

$$L = \frac{1}{2} E_{t_0} \sum_{t=t_0}^{\infty} \beta^{t-t_0} [\lambda_{y_h} (\hat{Y}_{H,t} - \tilde{\tilde{Y}}^h_{H,t})^2 + \lambda_{\pi_h} \pi^2_{H,t}] + \text{t.o.c.}$$

for country H and

$$L^* = \frac{1}{2} E_{t_0} \sum_{t=t_0}^{\infty} \beta^{t-t_0} [\lambda^*_{y_f} (\hat{Y}^*_{F,t} - \tilde{\tilde{Y}}^f_{F,t})^2 + \lambda^*_{\pi_f} \pi^{*2}_{F,t}] + \text{t.o.c.}$$

for country F.

Should add part on how to implement optimal cooperative solution. Targeting rules (see Svensson (2001))

- Targeting rules when $\bar{\mu} = 1$

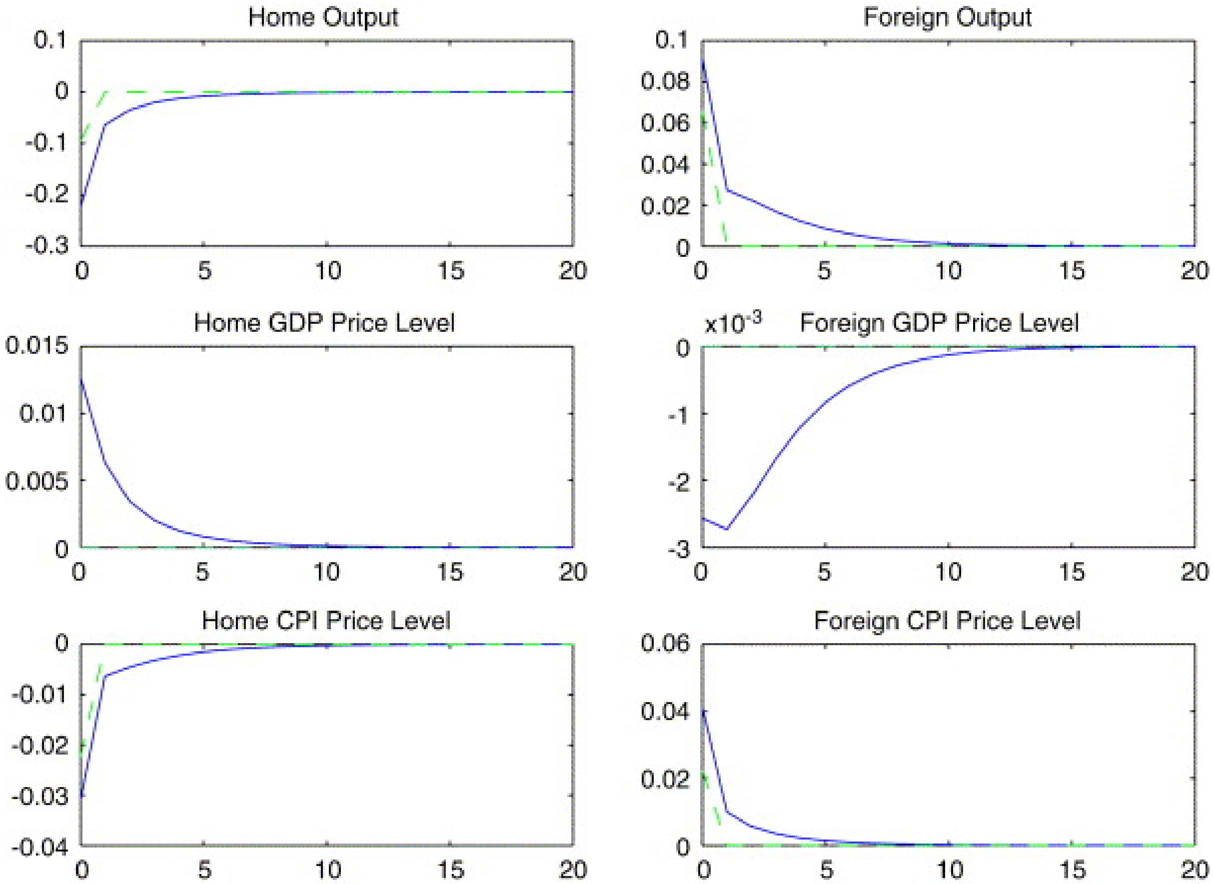
$$\sigma s_c^2 \pi_{H,t} + \Delta y_{H,t} = 0, \tag{6}$$

$$\sigma s_c^2 \pi^*_{F,t} + \Delta y^*_{F,t} = 0. \tag{7}$$

- More general case when $\bar{\mu} \neq 1$

$$(\kappa \lambda^w_{\pi_h} + \gamma)\pi_{H,t} + \lambda^w_y \Delta y_{H,t} - \gamma(\pi_t - \tilde{\pi}_t) = 0, \tag{8}$$

$$(\kappa^* \lambda^w_{\pi_f} + \gamma)\pi^*_{F,t} + \lambda^w_y \Delta y^*_{F,t} - \gamma(\pi^*_t - \tilde{\pi}^*_t) = 0, \tag{9}$$



Home Output
0.1
0
-0.1
-0.2
-0.3
0
5
10
15
20
Foreign Output
0.1
0.08
0.06
0.04
0.02
0
0
5
10
15
20
Home GDP Price Level
0.015
0.01
0.005
0
0
5
10
15
20
x10^-3
Foreign GDP Price Level
0
-1
-2
-3
0
5
10
15
20
Home CPI Price Level
0
-0.01
-0.02
-0.03
-0.04
0
5
10
15
20
Foreign CPI Price Level
0.06
0.04
0.02
0
0
5
10
15
20

Figure 1:

Model with LCP

- Comparisons with targeting rules above is important to see how prescription of optimal monetary policy changes.

- Intuition is that CPI inflation might be more important. Does it show up in the targeting rules?

Model with non-tradable goods

- Targeting rules again are important to read differences.

International financial markets:

- Departure from complete-market hypothesis. Relevance of exchange rate as a way to shift wealth across countries

- Step back: why do you assume financial autarky?

- Should assume trade in assets: bonds and equity. Difficult, but a step forward.

- Problems: optimal monetary policy problem when portfolio positions are endogenous is not easily solvable. Cannot be solved with LQ methods.

- Easy way is to add transaction frictions to determine steady-state portfolio holdings (see Benigno (2008), Ghironi and Rebucci (2007))

- Better way is to assume transaction frictions which are of second-order importance and so do not affect first-order approximations to the problem but they continuously move in a way to keep portfolio shares unchanged when monetary policy changes.

- Suggestion:
  - should present a model with incomplete financial market but a rich set of assets (two equities, two bonds)
  - assume second-order trading costs and set portfolio holdings to match those of the data
  - Analyze optimal cooperative and non-cooperative allocations.

- Role of the exchange rate as a shock absorber (similar to fiscal theory of price level) completely change transmission mechanism of shocks. (Benigno, JED)

- Following a *permanent* productivity shock in one country:

  - intertemporal approach to the current account would suggest that the consumption of the country that experiences the favorable shock increases proportionally without any changes in the net-foreign asset position.

  - Instead, global efficiency would require a transfer of real wealth to the other country.

  - An appreciation of the nominal exchange rate acts as a negative financial shock that reduces the portfolio return of the country with the high productivity.

- This channel worsens in a permanent way its net foreign asset position and results in a permanent transfer of wealth to the other economy.
- Through this mechanism consumption can also increase abroad.

- Trade in a riskless real bond. Intertemporal resource constraint of the domestic economy implies

$$B_{t-1} = E_t \left\{ \sum_{\tau=t}^{\infty} \beta^{\tau-t} \frac{C_\tau^{-\rho} g_\tau^{\rho}}{C_t^{-\rho} g_t^{\rho}} \left[\frac{P_{H,\tau}}{P_\tau} Y_\tau - C_\tau \right] \right\}.$$

- Trade in a riskless nominal bond denominated in domestic currency

$$\frac{B_{t-1}}{P_t} = E_t \left\{ \sum_{\tau=t}^{\infty} \beta^{\tau-t} \frac{C_\tau^{-\rho} g_\tau^{\rho}}{C_t^{-\rho} g_t^{\rho}} \left[\frac{P_{H,\tau}}{P_\tau} Y_\tau - C_\tau \right] \right\}.$$

- Trade in two risk-free bonds, one denominated in country H currency and the other in country F currency.

$$\frac{B_{t-1}}{P_t} - \frac{S_t A_{t-1}^*}{P_t} = E_t \left\{ \sum_{\tau=t}^{\infty} \beta^{\tau-t} \frac{C_\tau^{-\rho} g_\tau^{\rho}}{C_t^{-\rho} g_t^{\rho}} \left[\frac{P_{H,\tau}}{P_\tau} Y_\tau - C_\tau \right] \right\}.$$

- Efficient allocation is no longer implementable when markets are incomplete

- Indeed there are some conflicting targets:

  - Objective of price stability, because producer inflation creates inefficient dispersion of prices among goods produced according to the same technology,

  - Objective of efficient consumption risk-sharing,

  - Objective of efficient allocation of resource through relative price adjustment, terms-of-trade objective.

- These objectives are captured by the following quadratic approximation of the Pareto problem

$$\mathsf{E}_{t_0} \sum_{t=t_0}^{\infty} \beta^{t-t_0} \{(\rho+\eta)\cdot[\hat{C}_t^W - \tilde{C}_t^W]^2 + s(1-s)\rho[\hat{C}_t^R - \tilde{C}_t^R]^2$$
$$+n(1-n)(1+\eta\theta)\theta\cdot[\hat{T}_t - \tilde{T}_t]^2 + n\frac{\sigma}{k}(\pi_{H,t})^2 + (1-n)\frac{\sigma}{k^*}(\pi_{F,t}^*)^2\}$$

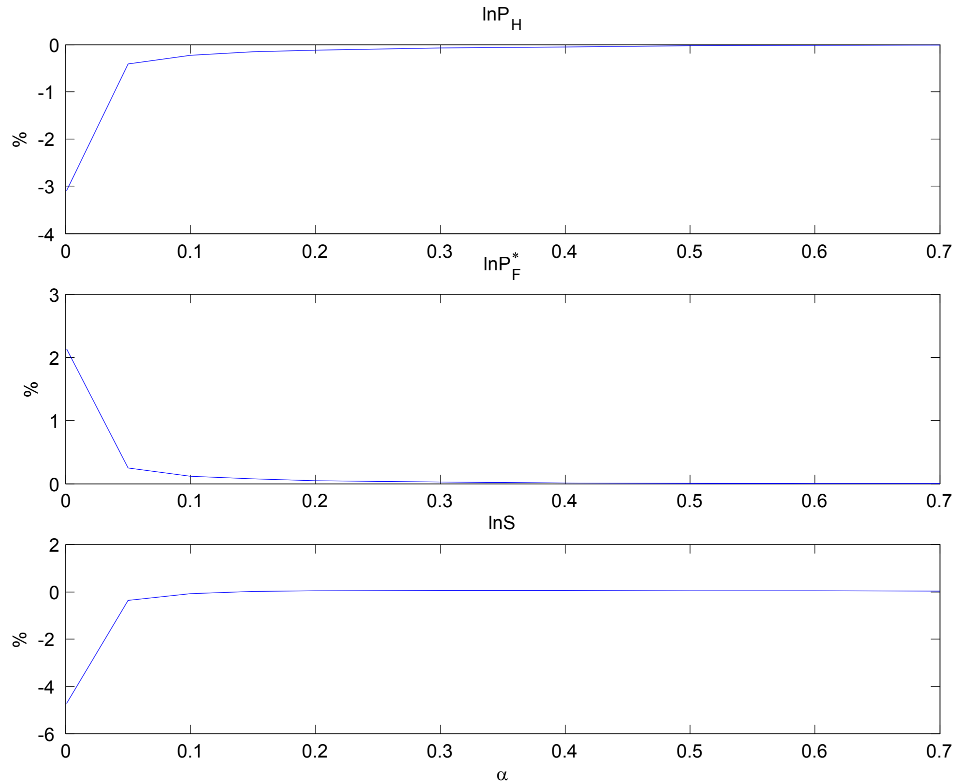


Figure 2: Percentage changes of prices (ln P_H and ln P_F^*) and exchange rate (ln S) between the final and initial steady states for different degrees of nominal rigidities (α) following a 1% permanent increase in productivity in country H.

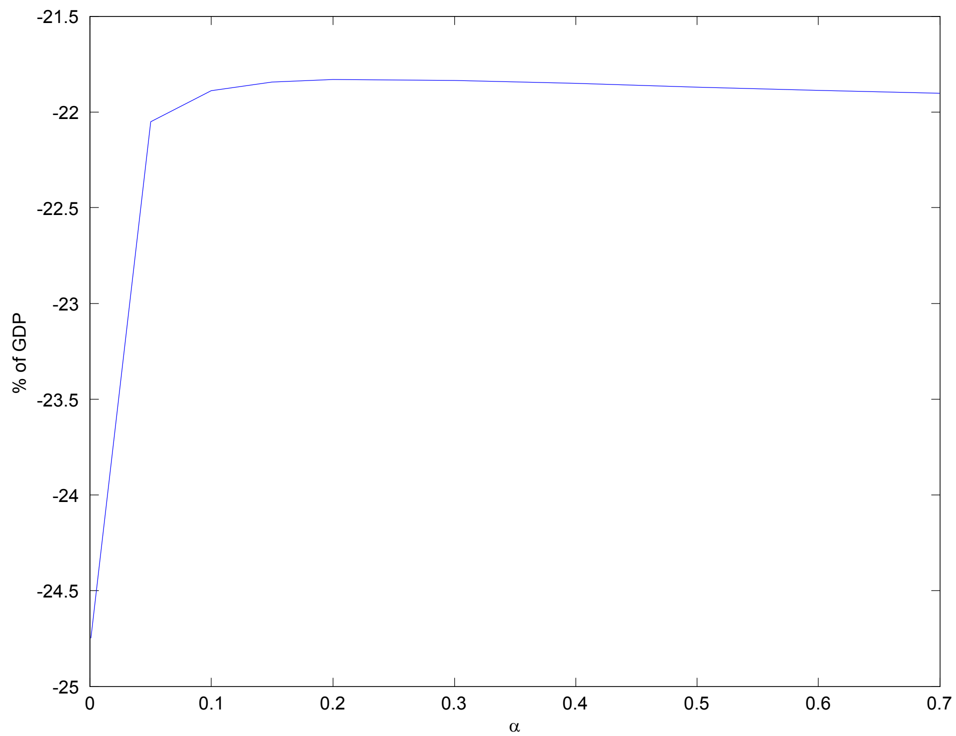


Figure 3: Ratio between the long-run value of the net foreign assets and GDP in country H for different degrees of nominal rigidities (α) following a 1% permanent increase in productivity in country H. (Initial steady state is -22% of GDP)

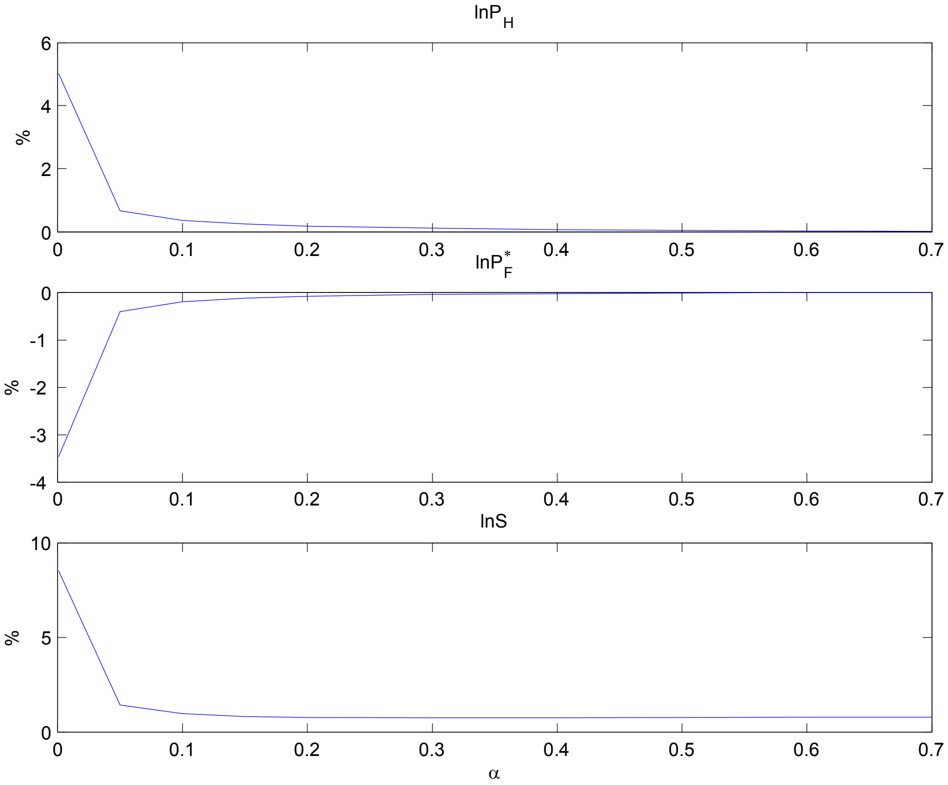


Figure 4: Percentage changes of prices (ln P_H and ln P_F^*) and exchange rate (ln S) between the final and initial steady states for different degrees of nominal rigidities (α) following a 1% permanent increase in the preference shock in country H.

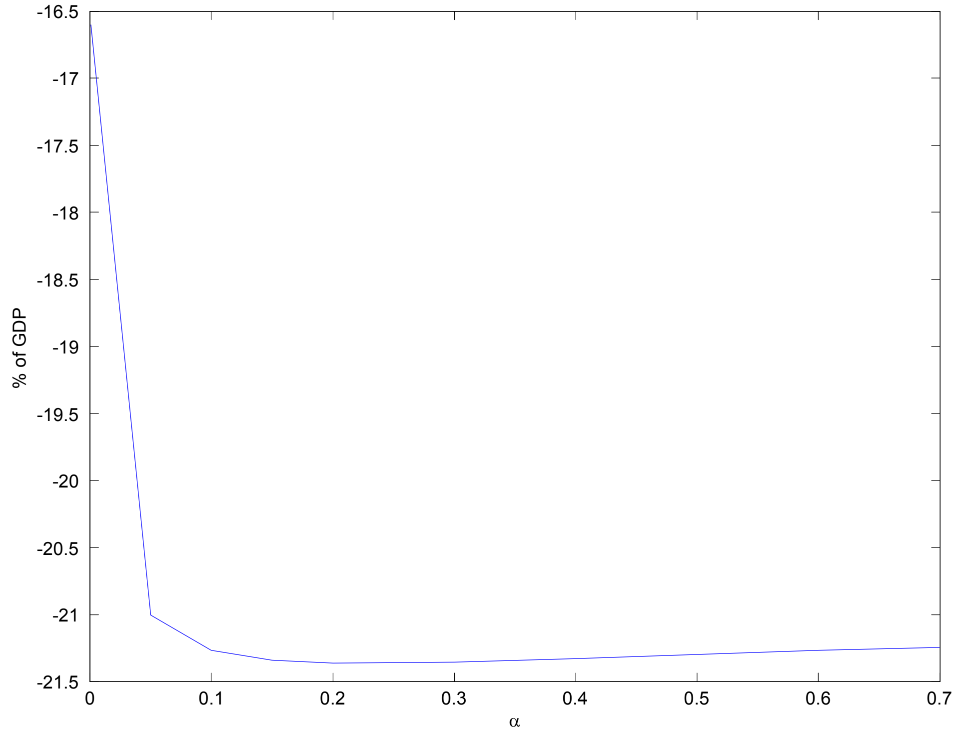


Figure 5: Ratio between the long-run value of the net foreign assets and GDP in country H for different degrees of nominal rigidities (α) following a 1% permanent increase in the preference shock in country H. (Initial steady state is -22% of GDP)