

Central Bank Independence: Implications in a Global Macroeconomic Environment

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Introduction

The macroeconomic theory and science upon which central banking is based has grown and evolved extensively over the course of the last century. One result of this development has been the widespread adoption of independent central banks, insulated somewhat from political pressures. What might happen, amidst the unprecedented interconnection of the present-day global economy, if the United States were to roll back this arrangement, removing the independence of its national central bank? As I show in this paper, loss of Federal Reserve independence would lead to economic instability in the United States as well as its trading partners. However, I also assert that a hypothetical regime of international cooperation between central banks could effectively contain the worst of the disruption.

This paper first explores the historical background that led to the worldwide adoption of central bank independence. Parts 2 and 3 comprise a literature review of relevant theoretical contributions; I also include a discussion of heterodox views on central bank independence, which problematize an unambiguously positive view of independently managed monetary policy. Part 4 develops a mathematical model to examine the effect that a loss of central bank independence might have upon the highly globalized modern economy. Part 5 discusses the results of the model. These results show that under reasonable assumptions, a loss of central bank independence would cause significant disruption in the world economy, but that collaborative action between the two central banks contains this disruption significantly. Part 6 discusses the limitations of the model, summarizes the paper, and concludes.

1. Historical Background

A recurring motif in the development of monetary policy since the pre-WWI period is that the emergence of money supply flexibility, needed for responding to economic crises, came at a cost. The Gold Standard heavily constrained the ability of participating countries to conduct monetary expansion. Participants included the most influential world powers of the time; the United States, Great Britain, Germany, and France, not to mention much of the rest of Europe (Bloomfield, 1959). Under the Gold Standard, exchange rates were notionally fixed. In practice, however, the Gold Standard was not completely rigid; there were means by which central banks could allow the real value of their currencies to vary when necessary.¹ As Eichengreen (2019) describes, nations could allow their currency value to fluctuate within a certain range; so long as it did not become profitable for bullion traders to import/export gold en masse for the purposes of currency arbitrage, currencies remained basically stable. Only when currency values drifted substantially (or, crucially, when traders believed they were about to) would gold begin to move from one country to another.

Though the specifics change, this pattern repeats. Currency market participants must believe in the central bank's commitment to maintain the value of the currency it governs; if they do not, they will sell the currency and push it towards devaluation. This can be observed in the dynamics that led to the end of the gold standard. Between the two world wars, pressure increasingly mounted to deviate from fixed currency values. This occurred for a number of reasons, including, per Kindleberger (1973), a shifting balance of international power in the wake of World War One, with the United States taking the place of Britain as reigning hegemon. Another shift that drove monetary expansion was the expansion of suffrage, with political power

¹ See Ansiaux (1910), particularly chapters 5 and 6, for a contemporaneous account.

gradually being divested from established elites. These elites, especially in Britain, had taken much of their incomes in fixed nominal terms, from bond holdings and other forms of rent. They thus favored a “strong” (high relative value) currency; because their incomes were effectively fixed, inflation would only decrease the real value of their holdings. Workers, by contrast, preferred the low unemployment rates associated with a greater ability of central banks to expand the money supply.² Further, the work of John Maynard Keynes (1936) provided a comprehensive theory relating monetary factors and productive output. The popularity of his *General Theory* accelerated the proliferation of expansionary preferences. It is against this backdrop that central bank independence in its contemporary form begins to have utility. While in the old regime, political incentives favored currency stability over increasing employment, these incentives had begun to reverse. The political will to keep inflation low was deteriorating rapidly.

The first World War dealt a mortal blow to the Gold Standard, and the Second World War was the nail in the coffin. The toll of warfare and the costs of European reconstruction demanded fiscal spending on a massive scale, financed by a deep supply of money. Only the United States, far from the theaters of war, was left with sufficient bullion reserves to maintain a hard currency. On July 1, 1944, 730 delegates from 44 nations met at Bretton Woods to determine the future of the international monetary system.³ Different powers came into the summit with different priorities; as Mikesell (1994) relates, the United States ended up with tremendous leverage over the new system. As the only currency still backed by gold, the dollar became the asset all other currencies were tied to, placing the U.S. at the center of the new international monetary order.

² See Eichengreen (1992) for the effects of the interwar Gold Standard in deepening and transmitting the Great Depression globally, and the role of ensuing class conflict in reshaping the course of economic policy.

³ See United States Department of State (1948) for a contemporaneous account of the proceedings.

This new arrangement had some interesting effects. Aside from a few early currency devaluations, participating countries other than the United States had effectively fixed exchange rates with the dollar (and thus, with each other); this imposed new constraints on the ability of these countries to expand their money supplies. The United States, by contrast, was far less limited. Even within the confines imposed by its gold supply, it had a remarkably free hand. A second, more limiting, constraint came into effect with the treasury-Fed accord of 1951. The accord decoupled the Federal Reserve from a prior obligation to keep interest rates low; this obligation had been an effort to ensure that government debt maintenance remained affordable.⁴

The arrangement resulting from the accord of 1951 put some distance between the monetary and fiscal policy apparatuses, and served as the foundation of Federal Reserve independence. This countervailed a tendency towards monetary expansion and inflation that would otherwise have been very strong; had monetary policy been directly in the hands of political actors, and not accountable to the demands of a fixed exchange rate like other countries were, the pressure for loose policy would have been immense. Political actors operate on relatively short timelines; they face an immense temptation to boost short-term output and employment, increasing their popularity before elections, but at the cost of systematically higher inflation in the long run. As it was, economic conditions were good enough in the U.S. that the Federal Reserve enjoyed not only de jure, but also largely unchallenged de facto, independence, until the Nixon years.

Nixon wanted a great deal of control over the U.S. government, and the Federal Reserve (often abbreviated as “Fed” in the literature, a convention I henceforth use) was squarely in his sights. As Abrams (2006) details, based on information from the Nixon tapes, the president fostered a very tight relationship with Fed chair Arthur Burns. He applied tremendous pressure

⁴ See Lucia (1983) for an account of the political conflict from which this accord emerged.

on Burns to expand the money supply, stimulating the economy to help his re-election bid; Burns often complied. Nixon also ended dollar-gold convertibility in 1971, causing the Bretton Woods system of fixed exchange rates to unwind over the course of the next few years.

The subsequent surge of inflation in the U.S. indicated that the private sector no longer had faith in the independence of the Federal Reserve (Eichengreen, 2019); anticipating more money in the economy chasing the same supply of goods, firms and workers systematically increased the price they charged for goods and services. Confidence would not be re-established until Paul Volcker's tenure as Fed chair in the early 80s. Volcker committed to a painful course of economic contraction, keeping interest rates high. This helped rebuild the institutional credibility of the Federal Reserve, affirming its ability to make short-term, politically dangerous sacrifices in service of long-run objectives.⁵

The end of the Bretton Woods Gold-Exchange Standard was handled differently around the world. As Ludlow's (1982) chronology entails, the eurozone countries allowed their currencies to float against the dollar and continued the long-running project of establishing a monetary union with fixed exchange rates *between* member countries (with most countries pegging their currency to the German Deutsche Mark). This was part of the effort that would culminate in the creation of the European Union in 1993, and eventually the Euro currency. Emerging markets in South America, Asia, and Africa typically also opted for fixed exchange rates, continuing to peg their currencies to the dollar. A great shift was underway, however. Increasing trade liberalization and relaxation of capital controls made fixed exchange rates increasingly costly for nations to maintain. According to economic theory, it is possible to achieve two of the following three policy objectives, but not all three: fixed exchange rates, free

⁵ For an academic treatment of Fed policy under Volcker, see (Goodfriend & King, 2005); for a more recent inquiry, see Dupor (2025)

capital mobility, and independent monetary policy.⁶ As countries dropped capital controls, they were forced to choose between maintaining their fixed exchange rates or having the ability to manage their money supply. This often came to a head in domestic banking crises; a fixed exchange rate limited the ability for governments to distribute money to beleaguered banks. Most countries, faced with this tradeoff, relinquished their currency peg to save the banks.

Following such crises, many countries established independent central banks, which could credibly commit to policies of inflation targeting. This served to accomplish the same goal as fixed exchange rates: setting the expected path of inflation on a stable trajectory. But crucially, it also preserved a degree of monetary independence, allowing response to unforeseen crises. Below, I outline the formal economic rationale behind the problem of systematically high inflation caused by democratic electoral institutions, and the utility of central bank independence (CBI) as a solution.

2. Theoretical Basis and Critiques of CBI

There is a significant body of literature covering how monetary policy actions affect economies. This paper lies at the intersection of two theoretical traditions within this body: the domestic time-inconsistency framework, and the international cooperation framework. The first investigates problems arising from the flexibility of monetary policy, and private sector expectations of policy priorities. The second discusses international coordination problems between central banks, under the assumption that policy decisions in one country have spillover effects upon the rest of the world. The former, characterized by the foundational work of (Kydland & Prescott, 1977) and refined by (Barro & Gordon, 1983), describes a basic problem in the timing of monetary policy and private sector decisions. Monetary policy has historically been

⁶ For early work discussing this “trilemma”, see Fleming (1962) and Mundell (1963); see also (Padoa-Schioppa 1994); for the canonical reference, see (Obstfeld et al., 2005)

more flexible than pricing decisions by firms and workers. This creates a temptation for central bankers; they could attempt to deploy a “surprise” monetary expansion, driving up demand and short-run output until prices in the economy eventually adjust upwards. If central banker is, or relies directly upon, an elected position, this benefits them directly. Due to this possibility, the private sector has an incentive to act in a manner that anticipates expansion. If the central bank has absolute control over its policy at every point in time, the theory goes, then prices and wages rise in expectation of expansionary policy, regardless of the central bank’s actual or announced plans. This is known as the “time-inconsistency problem”, because it involves the fact that the central bank cannot consistently commit to a policy trajectory.

Kenneth Rogoff’s work (1985b) discusses solutions to the problem, which amounts to convincing the private sector that the central bank will not deploy surprise monetary expansion. He focuses especially on the tradeoffs involved in binding the central bank via “rules”; if central bank responses are perfectly predictable (adjusting automatically via algorithmic methods), then the private sector knows that no surprise expansion will occur. The downside of such a rigid system is that responding to unanticipated shocks becomes very difficult. CBI, coupled with relatively transparent inflation targets, is the canonical solution to this problem. Independence gives the central bank freedom to credibly commit to long-run policy targets (for example, the Federal Reserve 2% inflation objective), while preserving the ability to deviate from the target to respond to shocks.⁷ Note that independence is most useful in democratic countries where political considerations pressure leaders towards excessive monetary expansion in the interests of short-run electoral concerns. As (Eggertsson & Le Borgne, 2004) finds, in countries where leaders are unelected and have long time horizons, CBI empirically has less of an effect.

⁷ For more on the operational matters associated with inflation targeting, see Wells (2024).

Authoritarians have less of an incentive to boost short-run employment, and the private sector acts accordingly.

The theory of the time-inconsistency problem, and the solution via independence, has been subjected to rigorous inquiry and critique. Empirical evaluations have offered tentative support for the theorized inflation-dampening effects, but also questioned whether reducing inflation volatility has any “real” benefit (in terms of actual economic activity).⁸ Recent empirical work has found CBI to be strongly effective in reducing inflation volatility, especially in the United States and Latin America; (Jácome & Pienknagura, 2024) finds, in keeping with (Eggertsson & Le Borgne, 2004), that efficacy of CBI seems to be correlated with how democratic the country in question is.⁹ Despite the findings in favor of CBI as a solution to the time-inconsistency problem, the supportive empirical evidence has been called into question on the basis of endogeneity; a number of papers have made the argument that the relationship between CBI and inflation is correlational rather than causal in nature.¹⁰ Additionally, there are many criticisms of CBI from a democratic perspective. By definition, it involves placing key economic policy instruments outside the direct control of a country’s elected representation.

The virtues of CBI are by no means a closed issue; empirical evidence on the effectiveness of independence remains open to endogeneity concerns, and there are a number of challenges that can be leveled from philosophical and political perspectives. Scholars have highlighted the inherent problem of legitimacy faced by independent central banks. Many, for example (Siderius, 2022), note that central banks may begin, or have begun, to exercise their power towards ends that are generally considered the proper purview of democratically

⁸ See (Alesina & Summers 1993) for the original empirical inquiry into the efficacy of CBI as such

⁹ See also (Garriga & Rodriguez, 2020).

¹⁰ For example, Posen (1995); see also (Campillo & Miron, 1997) which argues that the CBI-inflation relationship can be attributed to exogenous macroeconomic variables; and (Crowe & Meade, 2007) for a more recent investigation along similar lines.

accountable structures. Others directly argue for a tighter integration of central banking into the apparatus of democratic governance.¹¹ Still others, including Rogoff himself (2019) point out that the broad-based opposition to CBI and/or central bank policy in general represent a credible threat to the institutional setup as it currently exists, regardless of one's personal sentiments.¹²

As Mas (2019) argues, independence is not necessarily an all-or-nothing question; economic history is replete with examples of de facto institutional arrangements involving more, or less, independent central banks.¹³ A fluctuation in the “degree” of CBI in a particular country, of the type modeled in this paper as an increase in the central bank's employment target, is thus a very plausible shock that the world economy could face. Note that in this paper, I opt to focus on modeling the effects of CBI loss; I make no normative case one way or the other. A democratic polity could reasonably opt to sacrifice inflation stabilization for the sake of political accountability, or vice versa.

3. The International Coordination Literature

Having elaborated the theoretical foundations of CBI, and the solid but still disputed ground it presently stands upon, I now move on to the second critical resource that this paper draws upon: the interdependent economy monetary policy literature. Much of my method draws from the early work of (Canzoneri & Henderson, 1988, 1991), which expanded and formalized the foundational concepts presented in (Canzoneri & Gray, 1985).¹⁴ This tradition discusses international policy spillovers, and sets up a coordination game; a mathematical model is

¹¹ See Dietsch (2020) for a political science inquiry into the potential consequences of the Federal Reserve taking on additional objectives; and Epstein (2019) for general arguments around the political economy of central banking; see also Wray (2007) for the treatment of modern monetary theory, which argues for more radical reforms.

¹² See also (Binder & Skinner, 2023) for a timely survey on American sentiments regarding the legitimacy of the Federal Reserve.

¹³ For example, the Federal Reserve under Arthur Burns and under Paul Volcker were not de jure different institutions; but their de facto behaviors were very different.

¹⁴ See (Canzoneri et al., 2005) for a survey of the foundational literature.

developed to represent two countries, connected by trade in goods and financial assets. Because inflation in each country depends partially on prices of foreign goods, there is monetary policy interdependence; the two central banks react to economic shocks and to each others' actions. These analyses typically indicate that there are gains to be had from international cooperation in setting monetary policy; without cooperation, the two central banks impose costs on each other by trying to push the exchange rate between the two currencies in opposite directions.

The vast majority of the coordination literature excludes considerations of CBI, or the particular problem it is designed to solve.¹⁵ Though some efforts have been made to bridge the gap, it has been far from thoroughly explored. Rogoff (1985a) finds that in a simplified setting, with central banks that suffer from a lack of credibility with regard to the private sector, international cooperation actually increases the inflation arising from the time-inconsistency problem. This is because cooperation removes the only binding constraint on policy, and allows for a greater range of expansionary action. However, that paper is fairly limited in scope; it doesn't interrogate the deeper effects that might arise in a multiperiod environment, or in an environment with asymmetric central bank objectives. It does, however, derive a canonical and important result, namely that international cooperation is always superior to non-cooperation in responding to shocks.

A more recent body of work exists, which treats time-inconsistency as an element in the international monetary system from a New Keynesian perspective.¹⁶ However, these more recent papers tend to use relatively complex frameworks, which are not ideal for the specific interactions I aim to explore. Thus, I below specify a two-country, three-period New Keynesian

¹⁵ See (Ghironi & Giavazzi, 1998) for an explicit example. Much of the early coordination literature was developed with an eye towards interactions between the United States and the Euroarea, in an effort to inform efforts towards the development of the European Union; time-inconsistency was backgrounded in favor of elaborating the strategic considerations that might come into play.

¹⁶ For example, see Foresti (2018) for a model with fully specified microeconomic foundations.

monetary policy model, which incorporates rational expectations. For the sake of simplicity, I omit explicit microfoundations, instead deriving the underlying behavioral assumptions of my model from prior work in the New Keynesian tradition. The benefit of taking this tack is that I benefit from established microeconomic behavioral modeling, while preserving the approachability of a reduced-form macroeconomic system.

4. Modeling a Loss of Central Bank Independence Within a Global Framework

I present a two-country macroeconomic model, with the two countries designed to represent U.S. - China trade and financial dynamics; however, the framework could be used to explore a multitude of alternative global monetary dynamics with minor changes. My goal is to explore the effects of a shift in the central bank target “output level” (a theoretical analogue to GDP) in one country, of the sort that would be expected following a decrease in the level of CBI. As I discuss below, the interaction of time-inconsistency, global interdependence, and forward-looking expectational effects has some unintuitive consequences that go under-explored in the extant literature.

For the model specification, I deviate from the classic Canzoneri-Henderson model in a number of ways. First, updates are made to reflect advances in theory, as well as changes in the world economy since the baseline framework was originally devised.¹⁷ These changes also serve to make the model function in a multiperiod environment. In keeping with (Clarida et al., 1999), production and wage-setting conditions are collapsed into standard New Keynesian Phillips Curves, which do the work of relating prices and output. Additionally, real interest rates are indexed to future inflation values (rather than present-time values a la Canzoneri-Henderson).

¹⁷For example, the original framework placed pre-eminent importance on the role of worker unions in indexing wages to inflation, which is no longer realistic.

Second, I introduce a number of asymmetries; these are intended to reorient the framework for the context I aim to explore, in which interactions between the United States and China have gained a great deal of importance. I introduce a wedge term into the UIP condition that relates interest rates to the exchange rate; this reflects the “convenience yield” on U.S. assets, which generates an excess demand for assets denominated in dollars rather than those denominated in other currencies. The Phillips curves are asymmetric as well, which derives from structural distinctions between the two economies; China is subject to greater state price-setting in certain sectors, different labor market flexibility, and a larger share of administered prices.¹⁸

Finally, the loss functions for the two national central banks (equations which determine the preferences of those central banks) are asymmetric as well; the U.S. loss function includes a shock representing an increase in the output target, which would be expected if political pressure to raise employment was able to influence the Federal reserve to a greater degree. The China loss function includes the priority of minimizing exchange rate volatility, which reflects China’s state-directed export-led growth strategy; trade competitiveness is a crucial long-run goal of the PRC, which influences monetary policy greatly.¹⁹

For the sake of simplicity, and to focus on the effects of loss of CBI, this model omits any exogenous economic shock. This allows for a possible future extension; shock terms could enter through the Phillips curves, IS equations, and/or LM equations. This could be used to observe how loss of central bank independence changes equilibrium responses to supply, demand, or financial disturbances.

4.1 The Macroeconomic Model

¹⁸This parameterization is supported by a number of empirical investigations; for example, see (Hazell et al., 2022) for the United States; see (El-Shagi & Tochkov, 2024) for China.

¹⁹See (Funke & Tsang, 2021) for empirical inquiry into China’s monetary policy stance; see (Yi, 2019) for a speech from then-governor of the People’s Bank of China (PBoC) Yi Gang that, among other things, reiterates the exchange rate stability mandate baked into the bank’s charter.

See Appendix A for a full solution to the model; for brevity, I here present only the key structural relationships, and the reduced forms that determine policy actions and results. The model contains two goods, $y_t^{U.S.}$ and y_t^C . For the supply side:

$$\pi_t^j = \kappa^j y_t^j + \beta E_t(\pi_{t+1}^j)$$

Standard New Keynesian Phillips curves (NKPC) for each country, where the superscripts U.S. and C represent variables pertaining to the United States and China, respectively. This equation relates production of goods y_t^j (where $j = U.S., C$) and producer price inflation π_t^j in period t to the expectation formed at time t of the value for inflation in the next period $E_t(\pi_{t+1}^j)$. β is the discount factor (typically assumed to have a value slightly less than 1), reflecting the fact that future consumption is less valued than present consumption.

$0 < \kappa^j < 1, \kappa^{U.S.} < \kappa^C$, where κ^j represents the degree of nominal rigidity (stickiness of prices, wages, etc.) in each production environment, and the difference between $\kappa^{U.S.}$ and κ^C derives from structural distinctions between the two economies. Note also that in this context, $\pi_t^j \equiv p_t^j - p_{t-1}^j$, where p_t^j represents the price for a respective good at time t in country j . x' is an exogenous cost-push shock, which in this paper's analysis I hold equal to 0, as with all other exogenous shocks; in future work I may analyze the effect of exogenous shocks on the models behavior. The consumer price index (CPI) inflation in each country is given by:

$$\pi_t^{U.S., CPI} = a \cdot \pi_t^{U.S.} + (1 - a)(\pi_t^C + \Delta e_t)$$

$$\pi_t^{C, CPI} = a(\pi_t^{U.S.} - \Delta e_t) + (1 - a)(\pi_t^C)$$

This structure is drawn from (Canzoneri & Henderson, 1991), but changed to function in a dynamic environment. CPI inflation is a crucial policy variable for each country's central bank.

Here $0 < a < \frac{1}{2}$ is a size parameter describing the relative importance of the United States in the

world goods trade; the bounds enclosing its range of possible values have been chosen to reflect the United States' comparative trade disadvantage, as discussed in (Feenstra & Wei, 2010).

$\Delta e_t \equiv e_t - e_{t-1}$, where e_t is the prevailing exchange rate between the currencies of the two countries at time t .

The above expressions capture the fact that CPI inflation in the two countries is determined by PPI inflation in each country, the relative size of each country, and the bilateral exchange rate. The demand side of each economy is given by:

$$y_t^{\text{U.S.}} = v \left[a r_t^{\text{U.S.}} + (1-a) r_t^{\text{C}} \right] + \varepsilon \left[a \left(E_t \left(y_{t+1}^{\text{U.S.}} \right) \right) + (1-a) E_t \left(y_{t+1}^{\text{C}} \right) \right] - \delta (1-a) z_t$$

$$y_t^{\text{C}} = v \left[a r_t^{\text{U.S.}} + (1-a) r_t^{\text{C}} \right] + \varepsilon \left[a \left(E_t \left(y_{t+1}^{\text{U.S.}} \right) \right) + (1-a) E_t \left(y_{t+1}^{\text{C}} \right) \right] + \delta a z_t$$

IS equations for each country, which determine the demand for goods. These equations are informed by aggregate demand determination in the New Keynesian tradition; demand for each good depends on real interest rates in each country (defined below), expected future consumption, and the terms - of - trade (TOT) between the two countries, defined as $z_t \equiv e_t + p_t^{\text{U.S.}} - p_t^{\text{C}}$. Everything is affected by world trade shares a and $1-a$, and by structural parameters $0 < v < 1$, $0 < \varepsilon < 1$, and δ .

Real interest rates (inflation-adjusted interest rates) are defined by:

$$r_t^{\text{U.S.}} \equiv \left(i_t^{\text{U.S.}} - E_t \left(\pi_{t+1}^{\text{U.S.}} \right) \right)$$

$$r_t^{\text{C}} \equiv \left(i_t^{\text{C}} - E_t \left(\pi_{t+1}^{\text{C}} \right) \right)$$

where i_t^j is the nominal interest rate in country j at time t . The two nominal interest rates in the model are related via a modified UIP condition; this condition is determined by the arbitrage behavior of international investors.²⁰

²⁰Usage of UIP here is similar to its role in the Canzoneri-Henderson framework; see also (Galí & Monacelli, 2005)

$$i^{\text{U.S.}} - i^{\text{C}} = E_t(e_{t+1}) - e_t + \Psi$$

The above differs from benchmark UIP via the addition of the Ψ term; the original UIP derivation comes from models which assume complete asset markets and frictionless capital movement. Here, Ψ is assumed positive, and is intended to capture the myriad effects which make U.S. dollar bearing assets more attractive to investors than alternatives, aka the convenience yield; for simplicity I assume this term to be constant.²¹ Finally, to close the model, I specify an LM equation for each country:

$$m_t^{\text{U.S.}} - p_t^{\text{U.S.}} = y_t^{\text{U.S.}} - \lambda i_t^{\text{U.S.}}$$

$$m_t^{\text{C}} - p_t^{\text{C}} = y_t^{\text{C}} - \lambda i_t^{\text{C}}$$

where m_t^j is money supply in country j at time t , p_t^j is the price of good y_t^j at time t , and $0 < \lambda < 1$ is a parameter. These equations represent equilibrium conditions for the money market.

Before proceeding, I make a simplifying assumption; I assume that prior to P1, all expectations $E_t(\cdot) = 0$. This follows from the fact that in equilibrium, all variables are in steady-state, aka zero deviation from trend. Central banks minimize the following loss functions; these equations express what the policymakers want to avoid, which determines when and how they intervene in the economy. For the Federal Reserve and People's Bank of China, respectively:

$$L^{\text{Fed}} = \frac{1}{2} \left[\omega^{\text{U.S.}} (\pi_t^{\text{U.S., CPI}})^2 + (1 - \omega^{\text{U.S.}}) (y_t^{\text{U.S.}} - \theta \dot{y}')^2 \right], 0 < \omega^{\text{U.S.}} < 1$$

$$L^{\text{PBoC}} = \frac{1}{2} \left[\omega_1^{\text{C}} (\pi_t^{\text{C, CPI}})^2 + \omega_2^{\text{C}} (y_t^{\text{C}})^2 + \omega_3^{\text{C}} (e_t - e_{t-1})^2 \right], \omega_1^{\text{C}} + \omega_2^{\text{C}} + \omega_3^{\text{C}} = 1$$

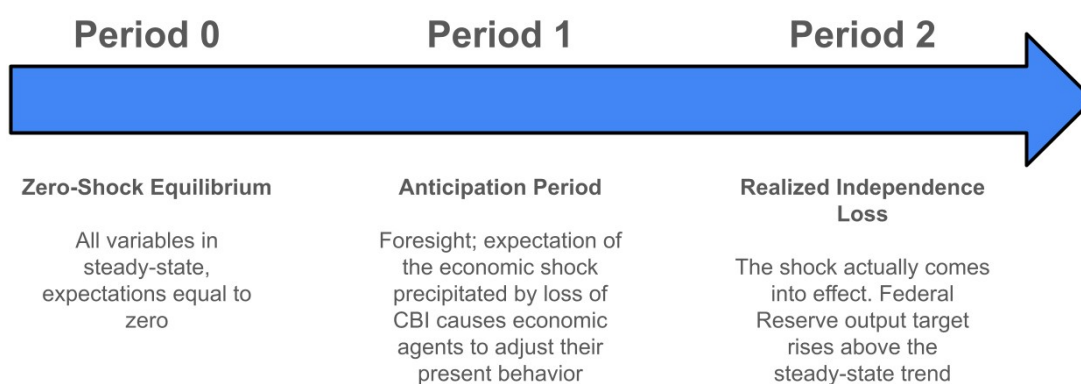
They differ in two key ways: the Fed output target contains a shock term, representing independence loss, and the People's Bank of China (referred to subsequently as "PBoC") loss

²¹There exists a significant body of theoretical and empirical literature discussing the convenience yield; see (Jiang et al., 2021) for a theory linking high dollar valuation to safe asset demand; see also Valchev (2020) which explicitly links convenience yields to the empirical breaking of standard UIP.

function contains an explicit exchange rate volatility term. This exacerbates the typical interdependencies found in these sorts of policy games, and is a crucial dynamic to consider for this particular international economic linkage.

In the Nash (non-cooperative) equilibrium, both central banks behave so as to minimize deviations of their respective policy variables from target levels, and they do so via the instrument of their own money supply. In the cooperative equilibrium, central banks collaborate so as to minimize the joint loss derived by combining their two loss functions, with equal weight on each. The three time periods of the model are as follows:

Figure 1: Model Timeline



The closed form of the model is obtained via basic algebraic methods and Cramer's rule.

Below, I provide reduced forms for the output and inflation in period 0 and period 1:

$$y^{\text{US}} = y_0^{\text{US}} + \alpha_1^{\text{US}} m^{\text{US}} + \alpha_2^{\text{US}} m^{\text{C}}$$

$$y^{\text{C}} = y_0^{\text{C}} + \alpha_1^{\text{C}} m^{\text{US}} + \alpha_2^{\text{C}} m^{\text{C}}$$

$$\pi^{\text{US,CPI}} = \pi_0^{\text{US,CPI}} + \Pi_1^{\text{US}} m^{\text{US}} + \Pi_2^{\text{US}} m^{\text{C}}$$

$$\pi^{\text{C,CPI}} = \pi_0^{\text{C,CPI}} + \Pi_1^{\text{C}} m^{\text{US}} + \Pi_2^{\text{C}} m^{\text{C}}$$

where α and Π terms are composites of the structural parameters of the model, representing policy sensitivities; the superscripts on these terms signify which country the coefficient is acting

upon, and the subscript represents which central bank controls the policy instrument to which the coefficient is attached (1 for the Fed, 2 for the PBoC). The structural model is linear in the policy instruments and the independence shock, yielding reduced forms that are affine in (m^{US}, m^C) .

The reduced forms are similar, but not identical, in period 2 when the independence shock is realized.

For reasonable calibration values (as described at the beginning of the following section, and detailed in Appendix B), increases in either policy variable positively affect output in both countries via demand spillover channels. On the inflation side, an increase in the policy variable in one country increases CPI inflation in that country, and decreases it in the other country.

Minimizing each central bank loss function with respect to that central bank's policy instrument (money supply) yields the reaction function for each central bank; how it sets money supply in response to economic conditions.

$$m^{US} = -\frac{F^{US}}{H^{US}} m^C - \frac{K^{US}}{H^{US}}$$

for the Federal Reserve, where

$$\begin{aligned} H^{US} &= \omega^{US} (\Pi_1^{US})^2 + (1 - \omega^{US}) (\alpha_1^{US})^2, \\ F^{US} &= \omega^{US} \Pi_1^{US} \Pi_2^{US} + (1 - \omega^{US}) \alpha_1^{US} \alpha_2^{US}, \\ K^{US} &= \omega^{US} \Pi_1^{US} \pi_0^{US, CPI} + (1 - \omega^{US}) \alpha_1^{US} (y_0^{US} - \theta \dot{y}') \end{aligned}$$

and

$$m^C = -\frac{F^C}{H^C} m^{US} - \frac{K^C}{H^C}$$

for the PBoC, where

$$H^C = \omega_1^C (\Pi_2^C)^2 + \omega_2^C (\alpha_2^C)^2 + \omega_3^C \epsilon_2^2,$$

$$F^C = \omega_1^C \Pi_2^C \Pi_1^C + \omega_2^C \alpha_2^C \alpha_1^C + \omega_3^C \epsilon_2 \epsilon_1,$$

$$K^C = \omega_1^C \Pi_2^C \pi_0^{C,CPI} + \omega_2^C \alpha_2^C y_0^C + \omega_3^C \epsilon_2 \Delta e_0,$$

and ϵ variables are composite coefficients representing policy exchange rate sensitivities.

This reduced form reveals the basic operation of the model under non-cooperation; central banks react to each other's money supply movements in an iterative fashion. For reasonable parameter values, this iterative process converges upon a Nash equilibrium:

$$m^{US*} = \frac{F^{US} K^C - H^C K^{US}}{H^{US} H^C - F^{US} F^C},$$

$$m^{C*} = \frac{F^C K^{US} - H^{US} K^C}{H^{US} H^C - F^{US} F^C}$$

The Nash equilibrium is different in each period; in period one, the different expectations entering the structural equations shift the reaction functions (however, their slopes remain the same). In period 2, the independence shock enters via the Federal Reserve loss function, which changes the Fed reaction slope; the Fed reacts more sharply to try and boost output, increasing money supply more quickly in response to external conditions.

In the cooperative case, a joint loss function which combines the two individual loss functions is minimized; instead of reacting to each other's behavior, central bank policy is planned simultaneously. This removes any competition between the two central banks to try to "export" inflation to the other country by over-tightening the money supply.

$$L^{Joint} = \mu^{U.S.} L^{Fed} + \mu^C L^{PBoC}$$

where for my case, I assume $\mu^{U.S.} = \mu^C = 0.5$ throughout, e.g. equal weights on each bank's loss.

The model shows that the independence shock, and anticipation thereof, generates economic turmoil, to which the central banks respond; in the non-cooperative case, the competitive disinflation dynamic between them inhibits their ability to respond to the shock, while in the

cooperative case they respond much more effectively. Of course, the possibility of cooperation under circumstances in which the institutional identity of one of the banks is itself in question, represents a dubious proposition. In the next section, I calibrate the model and analyze the economic effects of the independence shock under non-cooperative and cooperative regimes.

5. Results

5.1 Calibration

The model is calibrated to capture the essential asymmetries of the U.S.–China monetary relationship. Table 1 reports the baseline parameter values and their sources. The calibration is designed to isolate the effect of diminished central bank independence; the underlying model incorporates shock terms, but for this paper all structural shocks are set to zero ($x' = v' = u' = 0$), and the economy starts from a symmetric steady state. Under these conditions, the only sources of policy action are the convenience yield Ψ , expectations in Period 1, and the independence distortion $\theta\bar{y}'$ in Period 2. The baseline calibration is intended to maximize the simplicity and clarity of the independence-loss consequences; in Appendix B, I conduct a sensitivity analysis to test and discuss alternative parameter values.

Table 1: Baseline Calibration

Parameter	Symbol	Value	Notes
U.S. relative trade “size” parameter	a	0.45	Import share $1-a = 0.55$ for the U.S.; reflects high U.S. import dependence relative to bilateral trade volume.
U.S. Phillips curve slope	κ^{Us}	0.30	Lower slope reflects relatively greater U.S. price stickiness. Standard range in the New Keynesian literature, adjusted for scale relative to other parameters; see (Galí & Gertler, 1999), and (Ball et al., 1988)
China Phillips curve slope	κ^c	0.50	Higher slope captures greater Chinese price flexibility, consistent with the empirical econometric analysis of (Chang et al., 2015)
Interest rate sensitivity	ν	0.60	Output semi-elasticity to the trade-weighted real interest rate. Within the standard range.
Trade	δ	0.10	Low short-run expenditure switching. Justified by Ruhl (2008),

substitutability			which estimates that short-run trade elasticities are substantially below long-run values. Especially relevant in the trade relationship under current analysis.
Money demand semi-elasticity	λ	0.50	Standard parameterization. Ensures that the interest rate channel dominates the terms-of-trade response to output changes.
Convenience yield	Ψ	0.02	Dollar safe-asset premium, per (Jiang et al., 2021). Creates a permanent interest rate wedge favoring U.S. assets.
Phillips discount factor	β	0.99	Near-unit value generates effective Phillips slopes, $\kappa/(1-\beta)$, of 30 (U.S.) and 50 (China) in period 2.
IS expectations parameter	ε	0.95	Degree of output persistence in the forward-looking IS curve.
Fed: inflation weight	ω^{Us}	0.60	The Fed places majority weight on CPI inflation stabilization, consistent with the emphasis on price stability in the dual mandate.
PBoC: CPI weight	ω_1^c	0.40	The PBoC's tripartite loss function distributes weight across CPI inflation, output, and exchange rate stabilization.
PBoC: output weight	ω_2^c	0.30	(See above)
PBoC: exchange rate weight	ω_3^c	0.30	The exchange rate objective reflects China's managed float regime and the PBoC's revealed preference for exchange rate stability.
CBI loss parameter	θ	0.50	Moderate degree of independence erosion.
Output target	\bar{y}'	0.03	A 3% output target, representing the political pressure on the compromised Fed to push output above potential. Enters the Federal Reserve's loss function only in Period 2.
Cooperation weights	$\mu_{US} = \mu_C$	0.50	Equal weights in the cooperative planner's objective. Symmetric weighting avoids the distributional question, which this paper does not aim to address.

Several calibration choices merit further discussion. One is the United States share of world trade in the model. Expenditure share $a = 0.45$ means that 55% of the U.S. consumption basket consists of imported goods. This makes the U.S. the relatively more “open” economy. This may appear high relative to aggregate trade statistics, but it reflects the bilateral framing of the model. In a two-country world, all trade is bilateral, so the effective openness parameter absorbs trade that would be distributed across multiple partners in a richer model.

The low trade substitutability $\delta = 0.10$ is justified by Ruhl (2008), which documents that short-run trade elasticities are substantially below their long-run counterparts. This parameter value also reflects the nature of U.S – China trade, which is highly asymmetric. A more complex framework might model substitutability as a dynamic process, increasing in later periods, but for simplicity I opt to hold it constant in the baseline calibration.²²

The Phillips discount factor $\beta = 0.99$ is particularly important, because it drives the model’s most dramatic results. In Period 2, the effective Phillips curve slopes become $\kappa^{\text{US}}_{\text{eff}} = \kappa^{\text{US}}/(1-\beta) = 30$ and $\kappa^{\text{C}}_{\text{eff}} = 50$, which are dramatically steeper than the short-run slopes in earlier periods. This amplification is the mechanism through which Period 2 outcomes feed back powerfully into Period 1 expectations. Sensitivity analysis over $\beta \in \{0.90, 0.95, 0.99\}$ reveals qualitatively different dynamics at different values (see Appendix B), including a sign reversal in the anticipation-period output response near $\beta^* \approx 0.985$; the model is thus very sensitive to the magnitude of the market discount rate.

5.2 Baseline Results

Table 2 reports the equilibrium values of key macroeconomic variables under the Nash and cooperative equilibria across all three periods. Period 0 serves as the pre-shock baseline, Period 1 captures the anticipation of CBI erosion (with $\theta = 0$), and Period 2 is the stationary terminal period in which independence loss is realized ($\theta = \bar{\theta} = 0.5$). In this period, all expectations of future variables are equal to their present values; a new steady-state is reached.

Table 2: Equilibrium Values Under Baseline Calibration

	P0 Nash	P0 Coop	P1 Nash	P1 Coop	P2 Nash	P2 Coop

²² For details on the so-called “Armington elasticity”, see (Feenstra et al., 2018)

m^{Us}	-0.0055	-0.0055	-0.0401	-0.0056	+0.0031	-0.0051
m^c	+0.0045	+0.0045	-0.0362	+0.0044	+0.0065	+0.0047
y^{Us}	0.0000	0.0000	-0.0200	-0.0002	+0.0003	+0.0000
y^c	0.0000	0.0000	-0.0176	-0.0000	+0.0001	+0.0000
$\pi^{Us} CPI$	0.0000	0.0000	+0.0004	+0.0002	+0.0040	+0.0001
$\pi^c CPI$	0.0000	0.0000	+0.0008	+0.0002	+0.0117	+0.0003
Δe	0.0000	0.0000	-0.0004	-0.0001	-0.0076	-0.0002

The most striking feature of Table 2 is the Period 1 Nash column. Despite the fact that $\theta = 0$ in Period 1—central bank independence has not yet been formally compromised—both countries experience substantial output contractions: U.S. output falls by 2.0% and Chinese output by 1.76%. These contractions arise entirely from the anticipation of Period 2 inflation, and concomitant central bank conflict. Under Nash, private agents as well as each central bank anticipate that Period 2 will bring a costly policy conflict, with the Fed pursuing an inflationary output target, and the PBoC fighting the resulting exchange rate pressure. This causes the central banks in Period 1 to take aggressive preemptive positions, triggering a competitive disinflation spiral in Period 1 with drastic effects on economic output. The Fed in this period is effectively fighting not only against its counterpart in China, but also against its own future (inflationary) policy.

The anticipation channel ends up playing a similar role to that of exogenous cost-push shocks in old interdependence models; expected CBI loss effectively creates an instance of a classical Canzoneri-Henderson stabilization game, in the relevant period. Thus, as expected, output contraction is almost entirely neutralized under the cooperative regime. Unlike older

models, however, there are two reasons for this. The classic reason - the avoidance of competitive dynamics - and also the effect of cooperation on the anticipation channel itself. Period 1 cooperative output gaps are negligible ($y^{\text{US}} = -0.016\%$, $y^{\text{C}} = -0.003\%$), because agents expect a cooperatively managed Period 2 in which exchange rate conflict is resolved and the macroeconomic consequences of CBI loss are contained. A natural direction for future research would be to introduce uncertainty as to which independence regime and/or which cooperative regime will prevail in future time periods.

In Period 2, Nash equilibrium features modest U.S. monetary expansion ($m^{\text{US}} = +0.31\%$), generating U.S. CPI inflation of 0.40% and a dollar depreciation of 0.76%. China bears a disproportionate cost: Chinese CPI inflation reaches 1.17%, driven by the exchange rate passthrough. Cooperation essentially eliminates the exchange rate movement (Δe falls from -0.76% to -0.02%), dramatically reducing Chinese economic losses while leaving U.S. output largely unchanged.

5.3 Cooperation Gains and Welfare Analysis

Table 3 reports the period-by-period and present-value (discounted) cooperation gains, measured as percentage reductions in joint welfare loss when moving from Nash to cooperative equilibrium.

Table 3: Cooperation Gains (% Reduction in Joint Loss)

Period	θ	U.S. Gain	China Gain	Joint Gain	Dominant Channel
Period 0	0	—	—	—	No distortion
Period 1	0	+99.98%	+99.98%	+99.98%	Anticipation defusing

Period 2	$\theta = 0.5$	+6.48%	+99.93%	+46.45%	Exchange rate conflict
PV Total	—	+65.15%	+99.96%	+78.78%	—

Several features of Table 3 are noteworthy. First, the Period 1 cooperation gain is nearly total at +99.98%, confirming that the anticipation-period damage under Nash is almost entirely a coordination failure rather than an inherent consequence of anticipated CBI erosion. Second, the Period 2 gains are sharply asymmetric: China captures almost all the benefit (+99.93%) while the U.S. gains only +6.48%. This reflects the structure of the PBoC's loss function, which includes an exchange rate stabilization term ($\omega_3^c = 0.30$) that cooperation resolves almost perfectly. The Federal Reserve's loss function, dominated by the output gap component arising from the $\bar{\theta}y'$ target, is relatively insensitive to the cooperative adjustment because cooperation operates primarily through the exchange rate channel, not the domestic credibility channel. Third, the present-value joint gain of +78.78% is substantial, suggesting that the welfare case for monetary policy coordination strengthens markedly when CBI erosion is anticipated.

Rogoff (1985) showed that in a symmetric-country setting, international monetary cooperation can be counterproductive when one central bank lacks commitment, because cooperation removes the competitive-disinflation discipline that partially offsets the inflation bias. That result does not hold in the present framework. The reason is structural: in Rogoff's symmetric model, both countries' central banks are concerned only with output and inflation. In the present model, the dominant factor under cooperation is exchange rate management. The Rogoff counterproductivity result, in other words, is specific to the competitive-disinflation

channel and does not generalize to settings where the primary international externality operates through exchange rates.

To summarize: assuming certain structural conditions, international cooperation with a central bank that highly prioritizes exchange rate management significantly reduces the economic disruption and structural inflation that would otherwise accompany a decline in CBI. By cooperating, the Fed gains a new constraint for the one it has lost; its domestic policy targets are no longer disinflationary, but the exchange rate target is. The two-country economy would be under a managed exchange rate regime. In this context, the model results make a great deal of sense; they align with the extant monetary theory regarding exchange rate targets, and their ability to dampen inflationary expectations. A decline in central bank independence would be systematically inflationary, but as described in the historical section, cooperative action to fix the exchange rate would largely countermand the inflationary tendency.

6. Conclusion

This paper has discussed the historical and theoretical context of central bank independence, elaborated the arguments against it, and constructed a mathematical model to examine the consequences of partial CBI loss. The results of this model have shown that, within a certain type of international framework, loss of central bank independence in one country disrupts economic activity in that country, and in its trading partners as well. Further, this disruption occurs ahead of any actual change to the central bank's behavioral methodology, due to expectations of future shifts. Bilateral cooperation can partially contain the economic turmoil caused by a decline in CBI by imposing an exchange rate constraint on the inflationary central bank. This implies that international monetary coordination, often considered in the economic

literature to be a second-order (less important) source of policy gains, may in fact have a useful role to play in monetary policymaking.

The present analysis has a number of limitations. Among them is the fact that the model calibration is illustrative rather than empirical; parameter values are highly stylized, and at best the model only points in the right direction. Additionally, the analysis elides questions of institutional formation and enforcement mechanisms; under a realistic scenario, the same political pressures eroding CBI would also preclude constraining sovereign policymaking via international cooperation. Future research in this direction should aim to explore what effect uncertainty might have on the model results, how economic shocks would interact with independence loss, and what conditions might make cooperation more, or less, feasible.

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Appendix A: Full Model Solution

Here I show the full derivation of the model used in this paper. The framework is a two-country (U.S. - China), three-period New Keynesian monetary policy game. All variables are log-deviations from initial steady state.

This appendix proceeds as follows: first, I derive the reduced-form structural model. Second, I derive central bank reaction functions, Nash equilibrium, and the cooperative equilibrium. These results apply to periods 0 and 1. I then solve the model for period 2, which is required in order to produce the expectations terms that feed back into period 1. Finally, I provide general concluding notes on the derivation.

A.1 Derivation of Structural Reduced Forms

This section begins with the basic structural equations of the model, and works through the solution of that system. This structure holds in periods 0 and 1, though period 2 differs as I will later detail. The five structural equations (which I will refer to as, in order, NKPC, IS-US, IS-C, LM, UIP):

$$\pi_t^j = \kappa^j y_t^j + \beta E_t(\pi_{t+1}^j)$$

$$y_t^{\text{US}} = \varepsilon \left[a E_t(y_{t+1}^{\text{US}}) + (1-a) E_t(y_{t+1}^{\text{C}}) \right] - v W_t - \delta(1-a) z_t$$

$$y_t^{\text{C}} = \varepsilon \left[a E_t(y_{t+1}^{\text{US}}) + (1-a) E_t(y_{t+1}^{\text{C}}) \right] - v W_t + \delta a z_t$$

$$m_t^j - p_t^j = y_t^j - \lambda i_t^j$$

$$i_t^{\text{US}} - i_t^{\text{C}} = E_t(e_{t+1}) - e_t + \Psi$$

where $j=(U S, C)$ and $W_t = a r_t^{\text{US}} + (1-a)r_t^C$ is the “world real interest rate” (composed of national real rates weighted by country size). National real interest rates are given by $r^j = i^j - E(\pi_{+1}^j)$. Note that $z_t = e_t + p_t^{\text{US}} - p_t^C$ is the terms of trade (TOT), e_t is the exchange rate (rising when the dollar depreciates, falling when the dollar appreciates), and $\Psi > 0$ is the dollar asset convenience yield. CPI inflation in each country is given by:

$$\pi_t^{\text{US,CPI}} = a \pi_t^{\text{US}} + (1-a)(\pi_t^C + \Delta e_t)$$

$$\pi_t^{C,\text{CPI}} = a(\pi_t^{\text{US}} - \Delta e_t) + (1-a)\pi_t^C$$

where Δe_t is the first difference of the exchange rate, or $e_t - e_{t-1}$. Note also that $\pi_t^j \equiv p_t^j - p_{t-1}^j$.

Over the course of this appendix, I will define auxiliary variables when possible, to simplify the notation. I now define the following:

$$\varphi^j \equiv 1 + \kappa^j$$

$$\sigma^{\text{US}} \equiv \kappa^{\text{US}} - \frac{\varphi^{\text{US}}}{\lambda}, \sigma^C \equiv \frac{\varphi^C}{\lambda} - \kappa^C$$

$$\varrho \equiv \frac{\lambda - 1}{\lambda}$$

additionally, for further reduction in notational clutter, t subscripts will be omitted wherever possible, so $t - 1$ will be indexed as a subscript of -1 , etc. Also, expected values of next-period variables will henceforth be denoted by a hat where applicable (so, for example, $E_t(\pi_{+1}^{\text{US}}) \equiv \hat{\pi}^{\text{US}}$)

To begin, solve for the nominal interest rate in terms of other variables. Move y_t^j to the LHS of (LM), and divide both sides by $-\lambda$. Via (NKPC) and the definition of inflation in this framework as the first difference of prices, (LM) becomes:

$$i^j = \frac{(1+\kappa^j) y^j - m^j + p_{-1}^j + \beta E_t(\pi_{+1}^j)}{\lambda}$$

or,

$$i^j = \frac{\varphi^j y^j - m^j + p_{-1}^j + \beta E_t(\pi_{+1}^j)}{\lambda}.$$

Next, the exchange rate can be eliminated by substituting the above into (UIP); doing so and rearranging the resulting expression yields:

$$e = \hat{e} + \Psi - \frac{1}{\lambda} [\varphi^{\text{US}} y^{\text{US}} - \varphi^{\text{C}} y^{\text{C}} - \tilde{m} + \dot{p} + \beta \hat{\Delta}_\pi]$$

where $\tilde{m} \equiv m^{\text{US}} - m^{\text{C}}$, $\dot{p} \equiv p_{-1}^{\text{US}} - p_{-1}^{\text{C}}$, and $\hat{\Delta}_\pi \equiv \hat{\pi}^{\text{US}} - \hat{\pi}^{\text{C}}$. Substituting this expression for e into the TOT definition ($z_t = e_t + p_t^{\text{US}} - p_t^{\text{C}}$) yields

$$z = \hat{e} + \Psi + \sigma^{\text{US}} y^{\text{US}} + \sigma^{\text{C}} y^{\text{C}} + \frac{\tilde{m}}{\lambda} + \left(1 - \frac{1}{\lambda}\right) (\dot{p}) + \left(1 - \frac{1}{\lambda}\right) \beta \hat{\Delta}_\pi$$

or

$$z = \hat{e} + \Psi + \sigma^{\text{US}} y^{\text{US}} + \sigma^{\text{C}} y^{\text{C}} + \frac{\tilde{m}}{\lambda} + \varrho \dot{p} + \varrho \beta \hat{\Delta}_\pi.$$

From here, the process of deriving the reduced forms of the IS equations is not complex in concept, though the algebra is tedious. It is possible to extract nominal interest rates and national inflation expectations from the world real interest term W , and define trade-weighted output expectations and trade-weighted inflation expectations as, respectively,

$$\hat{E}_y \equiv a E_t(y_{t+1}^{\text{US}}) + (1-a) E_t(y_{t+1}^{\text{C}})$$

$$\hat{E}_\pi \equiv a E_t(\pi_{t+1}^{\text{US}}) + (1-a) E_t(\pi_{t+1}^{\text{C}})$$

Doing so, (IS-US) becomes:

$$y^{US} = \varepsilon \hat{\mathcal{E}}_y + v \hat{\mathcal{E}}_\pi - v a i^{US} - v(1-a)i^C - \delta(1-a)z$$

and (IS-C) similarly becomes:

$$y^C = \varepsilon \hat{\mathcal{E}}_y + v \hat{\mathcal{E}}_\pi - v a i^{US} - v(1-a)i^C + \delta a z.$$

Substituting in the reduced forms for nominal interest rates and the TOT yields the following for the relevant terms in the IS equations:

$$-v a i^{US} = -\frac{v a}{\lambda} \varphi^{US} y^{US} + \frac{v a}{\lambda} m^{US} - \frac{v a}{\lambda} p_{-1}^{US} - \frac{v a \beta}{\lambda} \hat{\pi}^{US}$$

$$-v(1-a)i^C = -\frac{v(1-a)}{\lambda} \varphi^C y^C + \frac{v(1-a)}{\lambda} m^C - \frac{v(1-a)}{\lambda} p_{-1}^C - \frac{v(1-a)\beta}{\lambda} \hat{\pi}^C$$

$$-\delta(1-a)z = -\delta(1-a)\hat{e} - \delta(1-a)\Psi - \delta(1-a)\sigma^{US} y^{US} - \delta(1-a)\sigma^C y^C - \frac{\delta(1-a)}{\lambda} \tilde{m} - \delta(1-a)\varrho \dot{p} - \delta(1-a)\varrho \beta \hat{\Delta}_\pi$$

$$\delta a z = \delta a \hat{e} + \delta a \Psi + \delta a \sigma^{US} y^{US} + \delta a \sigma^C y^C + \frac{\delta a}{\lambda} \tilde{m} + \delta a \varrho \dot{p} + \delta a \varrho \beta \hat{\Delta}_\pi.$$

Substituting these into the IS curves and rearranging to isolate terms in y^j on the LHS yields the following system: Equation 1, LHS:

$$\left[1 + \frac{v a \varphi^{US}}{\lambda} + \delta(1-a)\sigma^{US} \right] y^{US} + \left[\frac{v(1-a)\varphi^C}{\lambda} + \delta(1-a)\sigma^C \right] y^C,$$

equation 1, RHS:

$$\frac{v a}{\lambda} m^{US} + \frac{v(1-a)}{\lambda} m^C - \frac{\delta(1-a)}{\lambda} \tilde{m} + d_1,$$

where

$$d_1 = \varepsilon \hat{\Xi}_y - v \left[-\hat{\Xi}_\pi + \frac{a}{\lambda} p_{-1}^{\text{US}} + \frac{a\beta}{\lambda} \hat{\pi}^{\text{US}} + \frac{(1-a)}{\lambda} p_{-1}^{\text{C}} + \frac{(1-a)\beta}{\lambda} \hat{\pi}^{\text{C}} \right] - \delta(1-a) [\hat{e} + \Psi + \varrho \dot{p} + \varrho \beta \hat{\Delta}_\pi].$$

Equation 2, LHS:

$$\left[\frac{va\varphi^{\text{US}}}{\lambda} - \delta a \sigma^{\text{US}} \right] y^{\text{US}} + \left[1 + \frac{v(1-a)\varphi^{\text{C}}}{\lambda} - \delta a \sigma^{\text{C}} \right] y^{\text{C}},$$

equation 2, RHS:

$$\frac{va}{\lambda} m^{\text{US}} + \frac{v(1-a)}{\lambda} m^{\text{C}} + \frac{\delta a}{\lambda} \tilde{m} + d_2,$$

where

$$d_2 = \varepsilon \hat{\Xi}_y - v \left[-\hat{\Xi}_\pi + \frac{a}{\lambda} p_{-1}^{\text{US}} + \frac{a\beta}{\lambda} \hat{\pi}^{\text{US}} + \frac{(1-a)}{\lambda} p_{-1}^{\text{C}} + \frac{(1-a)\beta}{\lambda} \hat{\pi}^{\text{C}} \right] + \delta a [\hat{e} + \Psi + \varrho \dot{p} + \varrho \beta \hat{\Delta}_\pi].$$

These reduced forms show the basic flow of economic interactions in this model; output depends on the two money supplies, and on the d terms which are functions of expected values, lagged prices, and the dollar asset convenience yield. Note the importance of trade-weighting, and of cross-country differentials; the crucial driver of economic outcomes in this model is the differences that arise between the two countries, modulated by relative size.

The following compact variables are defined:

$$A' = 1 + \frac{va\varphi^{\text{US}}}{\lambda} + \delta(1-a)\sigma^{\text{US}}$$

$$B' = \frac{v(1-a)\varphi^{\text{C}}}{\lambda} + \delta(1-a)\sigma^{\text{C}}$$

$$D' = \frac{va\varphi^{\text{US}}}{\lambda} - \delta a \sigma^{\text{US}}$$

$$E' = 1 + \frac{v(1-a)\varphi^C}{\lambda} - \delta a \sigma^C$$

$$G_1 = \frac{g_1}{\lambda} m^{US} + \frac{\xi(1-a)}{\lambda} m^C + d_1$$

$$G_2 = \frac{\xi a}{\lambda} m^{US} + \frac{g_2}{\lambda} m^C + d_2$$

where $g_1 \equiv va - \delta(1-a)$, $g_2 \equiv v(1-a) - \delta a$, and $\xi \equiv v + \delta$. The two equations become:

$$A' y^{US} + B' y^C = G_1$$

$$D' y^{US} + E y^C = G_2$$

By Cramer's rule,

$$DET_1 = A' E - B' D'$$

$$y^{US} = \frac{G_1 E - B' G_2}{DET_1}$$

$$y^C = \frac{A' G_2 - G_1 D'}{DET_1}.$$

Both output variables are now defined solely in terms of structural parameters, money supplies, and values determined by past or future periods. These expressions can be decomposed into:

$$y^{US} = y_0^{US} + \alpha_1^{US} m^{US} + \alpha_2^{US} m^C$$

$$y^C = y_0^C + \alpha_1^C m^{US} + \alpha_2^C m^C,$$

with money supply sensitivities

$$\alpha_1^{\text{US}} = \frac{E' g_1 - B' \xi a}{\lambda D E T_1}, \alpha_2^{\text{US}} = \frac{E' \xi (1-a) - B' g_2}{\lambda D E T_1}$$

$$\alpha_1^{\text{C}} = \frac{A' \xi a - D' g_1}{\lambda D E T_1}, \alpha_2^{\text{C}} = \frac{A' g_2 - D' \xi (1-a)}{\lambda D E T_1}$$

and baselines of $y_0^{\text{US}} = (E' d_1 + B' d_2) / D E T_1$ and $y_0^{\text{C}} = (A' d_2 + D' d_1) / D E T_1$.

For domestic inflation in each country, there is now:

$$\pi_t^j = \kappa^j (y_t^j + \alpha_1^j m^{\text{US}} + \alpha_2^j m^{\text{C}}) + \beta \hat{\pi}^j.$$

Substitute the reduced forms for output into the exchange rate equation, which can subsequently be expressed as follows:

$$e = \epsilon_0 + \epsilon_1 m^{\text{US}} + \epsilon_2 m^{\text{C}}$$

with money supply sensitivities

$$\epsilon_1 = -\frac{1}{\lambda} (\varphi^{\text{US}} \alpha_1^{\text{US}} - \varphi^{\text{C}} \alpha_1^{\text{C}} - 1)$$

$$\epsilon_2 = -\frac{1}{\lambda} (\varphi^{\text{US}} \alpha_2^{\text{US}} - \varphi^{\text{C}} \alpha_2^{\text{C}} + 1)$$

and baseline

$$\epsilon_0 = \hat{e} + \Psi - \frac{1}{\lambda} [\varphi^{\text{US}} y_0^{\text{US}} - \varphi^{\text{C}} y_0^{\text{C}} + \rho + \beta \hat{\Delta}_\pi].$$

With reduced forms for inflation and for the exchange rate attained, it is now possible to derive CPI inflation in each country as a linear combination of money supplies and baselines; recall:

$$\pi_t^{\text{US,CPI}} = a \pi_t^{\text{US}} + (1-a) (\pi_t^{\text{C}} + \Delta e_t)$$

$$\pi_t^{C,CPI} = a(\pi_t^{US} - \Delta e_t) + (1-a)\pi_t^C$$

where $\Delta e_t \equiv e_t - e_{t-1}$. Substituting in the reduced forms for national inflation and output in each country, and rearranging, the CPI inflation equations now become:

$$\pi^{US,CPI} = \pi_0^{US,CPI} + \Pi_1^{US} m^{US} + \Pi_2^{US} m^C$$

$$\pi^{C,CPI} = \pi_0^{C,CPI} + \Pi_1^C m^{US} + \Pi_2^C m^C$$

U.S. sensitivities and baseline:

$$\Pi_1^{US} = a\kappa^{US}\alpha_1^{US} + (1-a)\kappa^C\alpha_1^C + (1-a)\epsilon_1$$

$$\Pi_2^{US} = a\kappa^{US}\alpha_2^{US} + (1-a)\kappa^C\alpha_2^C + (1-a)\epsilon_2$$

$$\pi_0^{US,CPI} = a\kappa^{US}y_0^{US} + a\beta\hat{\pi}^{US} + (1-a)\left[\kappa^C y_0^C + \beta\hat{\pi}^C + \epsilon_0 - e_{-1}\right]$$

China sensitivities and baseline:

$$\Pi_1^C = a\kappa^{US}\alpha_1^{US} + (1-a)\kappa^C\alpha_1^C - a\epsilon_1$$

$$\Pi_2^C = a\kappa^{US}\alpha_2^{US} + (1-a)\kappa^C\alpha_2^C - a\epsilon_2$$

$$\pi_0^{C,CPI} = a\left[\kappa^{US}y_0^{US} + \beta\hat{\pi}^{US} - \epsilon_0 + e_{-1}\right] + (1-a)\left[\kappa^C y_0^C + \beta\hat{\pi}^C\right].$$

The structural model is now solved; there are solutions for all key policy variables that are linear combinations of the two money supplies and exogenous parameters (parameters that enter from past or future periods, or whose value is explicitly specified during calibration). I now proceed to specify central bank behavior, and solve for Nash and cooperative equilibria.

A.2 Central Bank Behavior and Equilibrium in Baseline Period 0

Under Nash equilibrium, the two central banks (Federal Reserve and People's Bank of China) minimize the following loss functions:

$$L^{\text{Fed}} = \frac{1}{2} \left[\omega^{\text{U.S.}} (\pi_t^{\text{U.S.,CPI}})^2 + (1 - \omega^{\text{U.S.}}) (y_t^{\text{U.S.}} - \theta \dot{y}')^2 \right], 0 < \omega^{\text{U.S.}} < 1$$

$$L^{\text{PBoC}} = \frac{1}{2} \left[\omega_1^{\text{C}} (\pi_t^{\text{C,CPI}})^2 + \omega_2^{\text{C}} (y_t^{\text{C}})^2 + \omega_3^{\text{C}} (e_t - e_{t-1})^2 \right], \omega_1^{\text{C}} + \omega_2^{\text{C}} + \omega_3^{\text{C}} = 1$$

they control their own instrument (money supply), while taking the other's instrument as given.

The Fed first-order condition for a minimum is given by:

$$\frac{\partial L^{\text{US}}}{\partial m^{\text{US}}} = \omega^{\text{US}} \pi^{\text{US,CPI}} \frac{\partial \pi^{\text{US,CPI}}}{\partial m^{\text{US}}} + (1 - \omega^{\text{US}}) (y^{\text{US}} - \theta \dot{y}') \frac{\partial y^{\text{US}}}{\partial m^{\text{US}}} = 0$$

Substituting in the reduced forms for output and CPI inflation, then differentiating, yields:

$$\omega^{\text{US}} \Pi_1^{\text{US}} (\pi_0^{\text{US,CPI}} + \Pi_1^{\text{US}} m^{\text{US}} + \Pi_2^{\text{US}} m^{\text{C}}) + (1 - \omega^{\text{US}}) \alpha_1^{\text{US}} (y_0^{\text{US}} - \theta \dot{y}' + \alpha_1^{\text{US}} m^{\text{US}} + \alpha_2^{\text{US}} m^{\text{C}}) = 0$$

Collecting terms in m^{US} , m^{C} , and constants:

$$H^{\text{US}} m^{\text{US}} + F^{\text{US}} m^{\text{C}} + K^{\text{US}} = 0$$

with

$$H^{\text{US}} = \omega^{\text{US}} (\Pi_1^{\text{US}})^2 + (1 - \omega^{\text{US}}) (\alpha_1^{\text{US}})^2$$

$$F^{\text{US}} = \omega^{\text{US}} \Pi_1^{\text{US}} \Pi_2^{\text{US}} + (1 - \omega^{\text{US}}) \alpha_1^{\text{US}} \alpha_2^{\text{US}}$$

$$K^{\text{US}} = \omega^{\text{US}} \Pi_1^{\text{US}} \pi_0^{\text{US,CPI}} + (1 - \omega^{\text{US}}) \alpha_1^{\text{US}} (y_0^{\text{US}} - \theta \dot{y}')$$

The PBoC's loss minimization proceeds similarly, with FOC

$$\omega_1^C \pi^{C,CPI} \frac{\partial \pi^{C,CPI}}{\partial m^C} + \omega_2^C y^C \frac{\partial y^C}{\partial m^C} + \omega_3^C (e - e_{-1}) \frac{\partial e}{\partial m^C} = 0$$

which, after substitutions, yields:

$$\omega_1^C \Pi_2^C [\pi_0^{C,CPI} + \Pi_1^C m^{US} + \Pi_2^C m^C] + \omega_2^C \alpha_2^C [y_0^C + \alpha_1^C m^{US} + \alpha_2^C] + \omega_3^C \epsilon_2 [(\epsilon_0 + \epsilon_1 m^{US} + \epsilon_2 m^C) - e_{-1}] = 0$$

or,

$$F^C m^{US} + H^C m^C + K^C = 0$$

with

$$H^C = \omega_1^C (\Pi_2^C)^2 + \omega_2^C (\alpha_2^C)^2 + \omega_3^C \epsilon_2^2$$

$$F^C = \omega_1^C \Pi_2^C \Pi_1^C + \omega_2^C \alpha_2^C \alpha_1^C + \omega_3^C \epsilon_2 \epsilon_1$$

$$K^C = \omega_1^C \Pi_2^C \pi_0^{C,CPI} + \omega_2^C \alpha_2^C y_0^C + \omega_3^C \epsilon_2 (\epsilon_0 - e_{-1})$$

With both FOCs, we can write them as below:

$$H^{US} m^{US} + F^{US} m^C = -K^{US}$$

$$F^C m^{US} + H^C m^C = -K^C$$

These “reaction functions” determine how each central bank sets its money supply in response to economic conditions and the money supply choice of the other central bank. Assuming reasonable parameter values, there exists a single, unique solution to this system; one can imagine money supply levels converging to this Nash equilibrium, with each central bank iteratively responding to the other’s action until equilibrium is reached. The solution is obtained via Cramer’s rule:

$$m^{US*} = \frac{F^{US} K^C - H^C K^{US}}{D^{Nash}},$$

$$m^{C*} = \frac{F^C K^{US} - H^{US} K^C}{D^{Nash}}$$

where

$$D^{Nash} = H^{US} H^C - F^{US} F^C$$

Cooperative Equilibrium

Under the cooperative equilibrium, the two central banks don't set money supplies taking the other's choice as given. Instead, a joint loss function combining the two central bank objectives is minimized with respect to both money supplies:

$$\mu_1 \frac{\partial L^{US}}{\partial m^{US}} + \mu_2 \frac{\partial L^C}{\partial m^{US}} = 0$$

where μ variables are weights. Minimizing yields two FOCs. The first from minimizing with respect to m^{US} :

$$\mu_1 (H^{US} m^{US} + F^{US} m^C + K^{US}) + \mu_2 (A_{11}^C m^{US} + F^C m^C + B_1^C) = 0$$

where

$$A_{11}^C = \omega_1^C (\Pi_1^C)^2 + \omega_2^C (\alpha_1^C)^2 + \omega_3^C \epsilon_1^2$$

$$B_1^C = \omega_1^C \Pi_1^C \pi_0^{C,CPI} + \omega_2^C \alpha_1^C y_0^C + \omega_3^C \epsilon_1 (\epsilon_0 - e_{-1})$$

The second FOC, from minimizing with respect to m^C :

$$\mu_2 (F^C m^{US} + H^C m^C + K^C) + \mu_1 (A_{22}^{US} m^C + F^{US} m^{US} + B_2^{US})$$

with

$$A_{22}^{\text{US}} = \omega^{\text{US}} (\Pi_2^{\text{US}})^2 + (1 - \omega^{\text{US}}) (\alpha_2^{\text{US}})^2$$

$$B_2^{\text{US}} = \omega^{\text{US}} \Pi_2^{\text{US}} \pi_0^{\text{US,CPI}} + (1 - \omega^{\text{US}}) \alpha_2^{\text{US}} (y_0^{\text{US}} - \theta y')$$

Refactoring yields the following:

$$H_{11} m^{\text{US}} + H_{12} m^{\text{C}} = -K_1$$

$$H_{12} m^{\text{US}} + H_{22} m^{\text{C}} = -K_2$$

with

$$H_{11} = \mu_{\text{US}} H^{\text{US}} + \mu_{\text{C}} A_{11}^{\text{C}}$$

$$H_{12} = \mu_{\text{US}} F^{\text{US}} + \mu_{\text{C}} F^{\text{C}}$$

$$H_{22} = \mu_{\text{US}} A_{22}^{\text{US}} + \mu_{\text{C}} H^{\text{C}}$$

$$K_1 = \mu_{\text{US}} K^{\text{US}} + \mu_{\text{C}} B_1^{\text{C}}$$

$$K_2 = \mu_{\text{US}} B_2^{\text{US}} + \mu_{\text{C}} K^{\text{C}}$$

and the cooperative solution is given by

$$m^{\text{US,coop}} = \frac{H_{12} K_2 - H_{22} K_1}{D^{\text{coop}}}$$

$$m^{\text{C,coop}} = \frac{H_{12} K_1 - H_{11} K_2}{D^{\text{coop}}}$$

where

$$D^{\text{coop}} = H_{11}H_{22} - (H_{12})^2$$

A.3 Periods 1 and 2

In Period 1, economic agents and central banks observe that Period 2 will bring CBI loss for the Fed. An important point of this model is that P1 expectations perfectly capture realized P2 values; this represents the fact that political decisions about independence and cooperation involve some planning and announcement ahead of time, giving economic agents time with the information about what is to come before it actually happens.

In any case, the structural model is the same for P1 as for P0; the only difference is the values that enter through the expectations channels, which are of course those for P2. All sensitivities are the same as P0, and P2 expectations affect only the intercepts of the central bank reaction functions. The procedure for deriving Nash and cooperative equilibria remains the same.

In period 2, the economy reaches a new steady-state and the system is stationary; all variables are expected to persist at their current values, so $E_2(x_{t+1}) = \hat{x} = x_t$. This stationarity transformation necessitates a new solution to the structural model for this period. The general Phillips curve equation becomes:

$$\pi^j = \kappa^j y^j + \beta \pi^j \implies \pi^j = \frac{\kappa^j}{1 - \beta} y^j \equiv \kappa_{\text{eff}}^j y^j$$

It is also useful to define

$$\varphi_{\text{eff}}^j \equiv 1 + \kappa_{\text{eff}}^j$$

With all expected values equal to current values, UIP becomes $i^{\text{US}} - i^{\text{C}} = \Psi$ and no longer serves to pin the value of the exchange rate by itself. However, via the i terms it still contains the variables for output, which themselves contain z (and thus e). It is possible, then, to solve for

$(y^{\text{US}}, y^{\text{C}}, e)$ via the three-equation system of the two IS curves and the stationary UIP. Doing so yields, in matrix form,

$$A^{(2)} \begin{pmatrix} y^{\text{US}} \\ y^{\text{C}} \\ e \end{pmatrix} = b^{(2)}(m^{\text{US}}, m^{\text{C}})$$

where

$$A_{11}^{(2)} = (1 - \varepsilon a) + v W_y^{\text{US}} + \delta(1 - a)\kappa_{\text{eff}}^{\text{US}}$$

$$A_{12}^{(2)} = -\varepsilon(1 - a) + v W_y^{\text{C}} - \delta(1 - a)\kappa_{\text{eff}}^{\text{C}}$$

$$A_{13}^{(2)} = \delta(1 - a)$$

$$A_{21}^{(2)} = -\varepsilon a + v W_y^{\text{US}} - \delta a \kappa_{\text{eff}}^{\text{US}}$$

$$A_{22}^{(2)} = (1 - \varepsilon(1 - a)) + v W_y^{\text{C}} + \delta a \kappa_{\text{eff}}^{\text{C}}$$

$$A_{23}^{(2)} = -\delta a$$

$$A_{31}^{(2)} = \varphi_{\text{eff}}^{\text{US}}/\lambda, A_{32}^{(2)} = -\varphi_{\text{eff}}^{\text{C}}/\lambda, A_{33}^{(2)} = 0$$

with $W_y^j = a^j(1 + (1 - \lambda)\kappa_{\text{eff}}^j)/\lambda$, $a^{\text{US}} = a$, $a^{\text{C}} = 1 - a$. The (2) superscript indicates the period under analysis. The RHS vector $b^{(2)}$ is affine in the two money supplies; the money supply sensitivities are obtained via:

$$\begin{pmatrix} \alpha_1^{\text{US},(2)} \\ \alpha_1^{\text{C},(2)} \\ \epsilon_1^{(2)} \end{pmatrix} = (A^{(2)})^{-1} \frac{\partial b^{(2)}}{\partial m^{\text{US}}}, \begin{pmatrix} \alpha_2^{\text{US},(2)} \\ \alpha_2^{\text{C},(2)} \\ \epsilon_2^{(2)} \end{pmatrix} = (A^{(2)})^{-1} \frac{\partial b^{(2)}}{\partial m^{\text{C}}}$$

where

$$\frac{\partial b^{(2)}}{\partial m^{US}} = \begin{pmatrix} va/\lambda \\ va/\lambda \\ 1/\lambda \end{pmatrix}, \frac{\partial b^{(2)}}{\partial m^C} = \begin{pmatrix} v(1-a)/\lambda \\ v(1-a)/\lambda \\ -1/\lambda \end{pmatrix}$$

The CPI inflation sensitivities can be obtained from:

$$\Pi_j^{US,(2)} = a \kappa_{\text{eff}}^{US} \alpha_j^{US,(2)} + (1-a) \kappa_{\text{eff}}^C \alpha_j^{C,(2)} + (1-a) \epsilon_j^{(2)}$$

$$\Pi_j^{C,(2)} = a \kappa_{\text{eff}}^{US} \alpha_j^{US,(2)} + (1-a) \kappa_{\text{eff}}^C \alpha_j^{C,(2)} - a \epsilon_j^{(2)}$$

The central bank FOC structures for this period are identical to those for period 2, except for the following changes: 1. Different sensitivity values, as described above, and 2. Realized value for the independence-loss shock, which affects the Federal reserve reaction function and the cooperative equilibrium like so:

$$K_{(2)}^{US} = \omega^{US} \Pi_1^{US,(2)} \pi_0^{US,CPI,(2)} + (1 - \omega^{US}) \alpha_1^{US,(2)} (y_0^{US,(2)} - \hat{\theta} \hat{y}')$$

$$B_2^{US,(2)} = \omega^{US} \Pi_2^{US,(2)} \pi_0^{US,CPI,(2)} + (1 - \omega^{US}) \alpha_2^{US,(2)} (y_0^{US,(2)} - \hat{\theta} \hat{y}')$$

The Nash and cooperative solutions follow from the procedure in period 0, solving for both money supplies via Cramer's rule.

Appendix B: Sensitivity Analysis and Notes on Calibration Method

In this section, I conduct a sensitivity analysis to determine how different parameter values affect the model results. I also discuss the method used to calculate the numerical results. The analytic solution derived in Appendix A was converted to a python script that, given input values, calculates the results given in Section 5. One challenge in this regard is posed by the circularity between periods 1 and 2 in the model; P1 values are determined in part by expectations of P2, but themselves also partially determine the very same P2 values that are expected. It is possible to resolve this analytically by taking the P1-P2 system jointly, and solving for P1 lagged prices; with those values, all other P1 joint solutions follow. I opted to instead resolve the circularity during calibration, by employing a script that performs dampened fixed-point iteration, passing values through P1 and P2 repeatedly until convergence.

B.1 Sensitivity Analysis with Alternative Parameter Values

Phillips Discount Factor (β)

The sensitivity of results to β is the most economically informative robustness check. At $\beta = 0.90$, the anticipation-period output response reverses sign: rather than a contractionary competitive disinflation, Period 1 features a modest expansion ($y^{\text{US}} = +0.41\%$). At $\beta = 0.95$, the expansion is somewhat larger (+0.64%). Only at values near the baseline $\beta = 0.99$ does the anticipation response turn contractionary (-2.00%). A threshold exists near $\beta^* \approx 0.985$ where the Period 1 output response passes through zero. Below this threshold, agents respond to anticipated CBI loss with an economic expansion; above it, the Phillips curve persistence generates a disinflation dynamic. In economic terms, this means that the model results are extremely sensitive to how agents evaluate the future. If the future has a low present-value, then agents in P1 do not apply the anticipatory inflationary pressure which sets off the competitive disinflation

spiral between central banks. Note that a value for β extremely close to 1 (such as the 0.99) is realistic for a model of very short-run economic dynamics. Empirically, agents tend to value holdings in, say, the next financial quarter, in a manner similar to present holdings.

Openness (a)

At $a = 0.50$ (symmetric countries), present-value cooperation gains fall to +24.3%, roughly one-third of the baseline. Symmetry reduces the scope for exchange rate conflict. At $a = 0.30$ (the U.S. as the substantially more open economy), gains increase to +43.4%, but with a distributional tension: the U.S. is marginally worse off under cooperation in Period 2 (gain = -1.2%). The cooperative solution, weighting both countries equally, sacrifices a small amount of U.S. welfare to achieve large Chinese gains through exchange rate stabilization. This distributional asymmetry raises questions about the political feasibility of cooperative arrangements, on top of the already difficult question of whether the loss of CBI itself precludes this sort of international cooperation.

Trade substitutability (δ)

Doubling δ to 0.20 increases the magnitude of P1 economic effects relative to those of P2 higher than they already are in the baseline model, amplifying the relative salience of expectational dynamics. This also reduces the PV cooperation gain to +69.9% (from +78.8%). Higher trade substitutability amplifies the expenditure-switching channel, making the terms of trade more responsive to policy differentials. In other words, with US and China goods twice as “substitutable” for one another, economic agents react more strongly to differences between the two countries by shifting expenditures from one to the other. This has implications for the long-run effect of CBI loss, or if CBI loss is forecast longer before it actually comes to pass. If the slower aspects of the world economy (capital allocation, export strategy, development of the

factors of production) have time to adapt in a manner that increases trade substitutability between the two countries after the shock, or in anticipation of the shock, then the expectational effects are that much stronger. Agents have more of an ability to reallocate their spending between the two countries.