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The Continuing Validity of Monetary Policy Autonomy
Under Floating Exchange Rates

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Abstract

Economic research in recent years has given considerable prominence to the issue of whether a floating exchange rate provides autonomy with regard to monetary policy to a central bank whose economy is highly open. In particular, Rey (2016) has argued that inflation-targeting advanced economies lack monetary policy autonomy by pointing to results suggesting that U.S. monetary policy shocks matter for the behavior of key financial variables in these economies. In contrast, it is argued in this paper that monetary autonomy *does* prevail in inflation-targeting advanced economies, notwithstanding the reaction of these economies' asset prices to U.S. monetary policy developments. The reason is that the monetary-autonomy argument, as advanced by Milton Friedman and as embedded in new open-economy models, rests on the fact that the monetary base is insulated from foreign influences under floating rates. This fact allows the home monetary authority to pursue a stabilization policy in which it has a decisive influence on nominal variables in the long run, as well as a short-run influence on real variables. The result that rest-of-world monetary policy is among the other factors affecting the short-run behavior of real variables (including real asset prices) in a small, floating-rate open economy turns out to be consistent with the traditional and appropriate concept of monetary policy autonomy under floating exchange rates. It follows that such effects of rest-of-world monetary policy on the home economy are consistent with the celebrated open-economy trilemma.

Key Words: monetary policy autonomy, floating exchange rates, inflation targeting, trilemma.
JEL Classification Numbers: E51, E52, F41.

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1. Introduction

"*Keynes could state the issue as a dilemma….* [*Subsequent history*] *has forced those of us who have written on this subject more recently to expand Keynes's dilemma to a trilemma. A country is compelled to choose two of the following three desirable objectives: stable prices* (*or, more generally, an independent monetary policy*), *a stable exchange rate* (*or, more generally, a predetermined path of exchange rates*), *freedom from exchange controls.*"

Friedman (1983, p. 37)

Economic research in recent years has given considerable prominence to the issue of whether a floating exchange rate provides, to a central bank whose economy is highly open, autonomy with regard to monetary policy.[1] If this autonomy existed, it would mean that the central bank—like its counterpart in a closed-economy or large-economy setting—could use monetary policy to choose a particular long-run inflation rate (perhaps in conjunction with the pursuit of other macroeconomic goals, such as keeping output close to potential). As the foregoing quotation suggests, a standard argument in monetary economics is that autonomy of this kind does arise from a floating-exchange-rate arrangement and that the autonomy prevails even in conditions of complete international mobility of capital.[2]

This result is often contrasted with the situation facing a small open economy when its exchange rate is fixed. In the case of a completely fixed exchange rate and globally mobile capital, monetary policy in the small open economy is directed toward stability of the external value of the currency and cannot be used in pursuit of objectives distinct from that goal.[3]

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[1] This prominence is evidenced by much of the material in Bordo and Taylor (2017).

[2] In the present discussion, complete or perfect capital mobility refers to a situation in which official (that is, governmental) controls on private-sector access to foreign exchange are not present. When reference is made here to complete capital mobility, it is not being taken for granted that capital markets in the home economy or foreign economy are free of imperfections or frictions or that agents in the small economy can obtain funds from the foreign economy on exactly the same terms as those available to a comparable agent in the foreign economy. Indeed, in many new open-economy models, including some of those discussed below, it is assumed that citizens of a small country who borrow from abroad encounter some form of fee or spread that makes their overall international borrowing cost different from the rest-of-world interest rate. Such model features may be appealing for technical reasons (see Schmitt-Grohé and Uribe, 2003) and also provide a more realistic account of the borrowing situation facing many small economies, including those that impose no exchange controls. But the inclusion of these model features does not in itself imply a violation of the assumption of complete mobility of international capital.

[3] Under a fixed exchange rate, monetary developments will still be decisive for the long-run inflation rate, as stressed in McCallum (1996, p. 143). However, with monetary policy choices dictated by the commitment to fix the exchange rate, monetary policy at home will be closely connected to rest-of-world monetary policy, and the economy's long-run inflation rate will consequently tend to be driven by that of the rest of the world.

The conclusion that monetary policy autonomy can be secured by a floating-rate arrangement has been challenged by Rey (2013). On the basis of empirical evidence, Rey argues that, under unimpeded international capital mobility, *neither* fixed exchange rates *nor* floating exchange rates are associated with monetary autonomy for a central bank. She contends that what many economists—including Milton Friedman in the above quotation—have called the "trilemma" is invalid.[4] Even with a flexible exchange rate, she suggests, monetary autonomy would be obtainable only if the open economy's authorities restricted capital-account transactions.

Although Rey (2013) focused on emerging economies, her basic argument concerning floating rates would, if valid, apply to emerging economies and advanced economies alike. And indeed Rey (2016) has extended the argument to small- and medium-sized advanced economies.[5] Accordingly, the discussion that follows focuses on advanced open economies—in particular, inflation-targeting countries that float their exchange rate.

The monetary-autonomy debate is of great relevance to such economies because both these economies' policymakers and outside observers have routinely accepted the standard argument in favor of autonomy. The United Kingdom, for example, has had a floating exchange rate since September 1992. Shortly after this float began, the Chancellor of the Exchequer, Norman Lamont, proclaimed: "We are floating and we will set monetary policy in this country… It will be a British economic policy and a British monetary policy."[6] The specific monetary policy chosen by Lamont—and continued over the past two decades of Bank of England operational independence—consisted of a strategy of inflation targeting. A second example is provided by Australia, which has had a floating exchange rate since 1983 and an inflation-targeting monetary policy strategy since the 1990s. Beaumont and Cui (2007, p. 1) stated that this experience had been associated with Australia "gaining the expected macroeconomic benefits from exchange rate flexibility," including monetary policy autonomy. The literature critical of the connection between floating and monetary policy autonomy is therefore a major challenge to the conventional wisdom concerning inflation-targeting economies.

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[4] Obstfeld (1998, p. 14) credited the use in the research literature of the "trilemma" terminology (to describe the conventional wisdom that monetary policy autonomy, fixed exchange rates, and complete capital mobility are not jointly obtainable, though any two are) to Obstfeld and Taylor (1998). This terminology was, however, used in the same context much earlier by Friedman in the press article quoted at the start of this paper.
[5] The term "advanced economies" below will generally be used to refer to these small- and medium-sized floating-rate advanced economies, whose central banks target inflation. Likewise, in the discussion in this paper, the phrase "home economy" or "open economy" will often stand in for "small open economy." Also, the terms "capital controls" and "foreign exchange controls" will be used interchangeably, while "reserves" will refer to commercial banks' reserve balances (a central bank liability), not foreign exchange reserves (a central bank asset).
[6] Quoted in *The Economist* (1992).

In contrast to the message of that literature, the position advanced here will be that a floating exchange rate *does* secure monetary policy autonomy. Consequently, provided that the exchange rate floats, official controls on capital mobility are not necessary to secure such autonomy.[7] Monetary policy autonomy under flexible exchange rates, it will be argued, is not merely an analytical result. Rather, it has practical validity and aids understanding of monetary and economic behavior in inflation-targeting economies. Results advanced by Rey and others in support of the contrary position do not, in fact, provide persuasive evidence of lack of monetary autonomy. The reason those results are not persuasive evidence is that the existence of monetary autonomy does not preclude, and indeed is highly consistent with, international financial integration.

The basis of the counterargument. A quotation from the abstract of Rey (2016) is helpful in bringing out the counterargument advanced here. Rey states: "*The paper presents evidence that U.S. monetary policy shocks are transmitted internationally and affect financial conditions even in inflation-targeting economies with large financial markets. Hence flexible exchange rates are not enough to guarantee monetary autonomy in a world of large capital flows.*"[8] One could not ask for a clearer articulation of the no-autonomy argument than the two sentences just quoted. But referring to those same sentences also provides a convenient means of expressing the crux of the counterargument, which is simply: The conclusion given in the second sentence does not follow from the first. That is, the word "Hence" connecting the sentences is unwarranted and the second sentence is a *non sequitur*.[9]

In fact, the transmission of U.S. financial developments (including those arising from U.S. monetary policy shocks or other U.S. monetary policy actions) to financial conditions in other, smaller, advanced economies is fully consistent with the possession of monetary autonomy by the central banks of those economies. The key point, as already suggested, is that monetary policy autonomy under a float can, and likely does, coexist with financial interdependence.

Objectives of the present analysis. Elements of the preceding point can be gleaned from some of the critical discussions of Rey (2013). But, to date, the communication of that point has been

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[7] This does not, of course, preclude the validity of other possible justifications for imposing such controls. See, for example, Pasricha (2017) for an analysis of different motivations for capital controls.
[8] In the present paper, quotations of one sentence or longer from prior work, which are followed by scrutiny of the quotations, are set off by being put in italics.
[9] The approach taken here is therefore consistent with, but somewhat different from, that in Taylor's (2016) defense of monetary autonomy. Taylor focuses on whether the empirical findings offered in recent years against autonomy are artefacts of the estimation sample periods, rather than on whether—if subsequently found to be durable—those results actually point to the absence of autonomy.

weakened by being left implicit, by taking the form of a side remark, or by appearing in the context of discussions that make undue concessions to the no-autonomy position.[10] A first objective of this paper, therefore, is to make the point central and explicit, doing so with specific reference to advanced inflation-targeting economies.

A second, related, objective of this paper is to bring out the shortcomings of the recent case against autonomy under floating exchange rates by comparing this case directly with the *standard* case for floating exchange rates. It will become clear that the results claimed to be at

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[10] Two prominent examples of affirmations of monetary autonomy that possess the characteristics just described are: (i) ***Bernanke (2015)***. Bernanke endorses the trilemma and the implication that monetary policy autonomy is obtainable under exchange-rate flexibility, even when complete capital mobility connects countries' financial systems (see Bernanke, 2015, p. 4). However, much of Bernanke's subsequent discussion is concerned with the circumstances under which a central bank decides to assign to monetary policy tasks other than stabilization of domestic economy-wide variables—not with whether stabilization is an available option. Bernanke (2015, pp. 14–15) indicates that, in the model he considers, using monetary policy in a way that makes output equal potential output is an option; in so doing, he challenges the claim of no autonomy and reaches a result highly consistent with the analysis given in the present paper. However, this result is presented in the course of an analysis in which the exchange rate is "the policy control variable" (p. 14), when in fact a defining characteristic of targeting domestic variables under floating rates is that the exchange rate is not controlled. Bernanke also likens monetary policy autonomy to results obtained under flexible exchange rates "in the standard Mundell-Fleming analysis" (p. 15). However, in the standard Mundell-Fleming analysis the domestic interest rate (but not the money stock) is pinned down by world conditions even under floating rates, provided that capital is internationally mobile. On that dimension, the Mundell-Fleming analysis gives results unlike those that one would normally associate in practice with monetary policy autonomy, as under autonomy one would expect key domestic interest rates to be affected by actions of the home country's central bank. For example, Romer (2000, pp. 164–165), in adjusting the diagrammatic Mundell-Fleming model to allow for interest-rate rules, finds it necessary to assume imperfectly mobile international capital. And importantly for the purposes of the present paper, because Bernanke (2015) does not dwell on the floating-rate case, he does not contemplate the possibility—stressed here—that the empirical phenomena stressed by Rey, far from refuting monetary autonomy, can operate even in conditions in which the exchange rate floats, the central bank has monetary autonomy, and that autonomy is used for domestic stabilization. (ii) ***Debelle (2017)***. Debelle notes that the Reserve Bank of Australia (RBA) controls a short-term interest rate and argues that management of this rate can deliver the aggregate-demand and inflation outcomes sought by the RBA in its inflation-targeting strategy. His argument amounts to a denial of the no-autonomy position. But this fact is largely left implicit. Indeed, Debelle (2017) states: "*Rey has recently described this state of affairs as a monetary dilemma…. That is, we can only set the monetary policy we want if we impose controls on the flow of capital in and out of the country. I don't think the situation is quite as stark as that. There is still a substantial degree of flexibility to set domestic monetary policy appropriately for domestic conditions. But I would certainly agree that the monetary policy decisions of other central banks are a significant factor to be taken into account in our monetary policy deliberations. Another way of stating this is that we don't have the independence to set the neutral rate, which is significantly influenced by global forces, but we do have the independence as to where we set our policy rate relative to the neutral rate.*" Although the conditions stated that begin with the sentence starting "But…" are presented as though they partially reconcile the Debelle and Rey positions on the situation facing a central bank under floating rates, they do not in fact imply any true concession to the Rey position of lack of monetary autonomy. International factors, including foreign monetary policy, can matter for the evolution of the domestic aggregate variable(s) targeted by a central bank that has monetary autonomy. And taking the neutral interest rate as externally-given is a situation that a central bank even in a large or closed economy typically faces; therefore, for a small open economy, the fact that the central bank does not set the neutral rate does not imply an absence of monetary policy autonomy.

variance with the existence of monetary autonomy do not in fact conflict with the basic notion of monetary autonomy advanced by advocates of floating rates.

In particular, the discussion in this paper will consider the monetary-autonomy argument used in Milton Friedman's (1953) case for exchange rate flexibility. That paper's argument is a useful benchmark because Friedman (1953) is widely accepted as a central reference on the issues discussed here.[11] Bringing his argument explicitly into the current debate highlights the sharp difference between (*a*) what believers in monetary autonomy under a floating rate thought was implied by autonomy and (*b*) what modern researchers have regarded as evidence that autonomy does not prevail under floating rates.

The recent literature on monetary autonomy has specifically cited Friedman's views on exchange rates and monetary autonomy only infrequently. For example, Rey (2013, 2016) does not cite Friedman's work. And when it has characterized Friedman's argument, the recent literature has sometimes attributed to him the opposite of his actual position.[12]

Rey (2016) does cite the classic work of Mundell (1963) that provided formal analysis of the incompatibility, for a country allowing complete capital mobility, of fixed exchange rates and an autonomous monetary policy. However, when considering the debate on monetary autonomy, Friedman's contributions provide a starker and more apposite counterpoint to Rey's position than does Mundell's work. There are three reasons for this. First, although Rey calls the trilemma the "Mundellian trilemma," the "trilemma" terminology was used in print by Friedman more than thirty years ago, long before it became prevalent. Second, as discussed below, Rey materially misstates the properties of the model Mundell developed, as she attributes it to a feature (the central bank's pursuit of stabilization policy using an interest-rate instrument) that is infeasible in that model (under both fixed and floating rates) but that is possible, under floating rates, in Friedman's framework.[13] Third, Mundell himself became a strong critic of floating exchange rates (see, for example, Mundell, 1968) and so, unlike Friedman, he is not particularly representative of the view that floating rates (alongside capital mobility) are attractive from the point of view of stabilization policy.

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[11] For example, Krugman (1993, p. 519) judged Friedman (1953) to be a "seminal paper," while McCallum (1996, p. 213) observed that Friedman (1953) was "the most famous and influential single piece of writing on exchange rate arrangements." See also Dellas and Tavlas (2017) and Irwin (2017) for recent analyses of the development of Friedman's article and the historical context in which it appeared.

[12] See the discussion in Section 2 below of Obstfeld and Taylor's (2017) portrayal of Friedman's argument.

[13] The Mundell-Fleming model does feature monetary autonomy under floating rates. But the autonomy is of a kind that is of questionable practical relevance, because the central bank is incapable under floating rates (alongside capital mobility) of managing interest rates.

In the course of the analysis below, it will be shown that the autonomy obtainable under flexible exchange rates in sticky-price models lines up with the autonomy Friedman described verbally in his writings. They have a common implication: asset prices can move together across countries whose exchange rates float, yet this does not imply that an open economy lacks monetary autonomy. A corollary is that empirical evidence that asset prices in inflation-targeting advanced economies respond to U.S. monetary policy actions does not in itself constitute valid evidence against autonomy.

The focus here is therefore on the generic problems with the type of evidence offered of late against autonomy under floating rates. This paper will not review that evidence in detail. Indeed, the empirical findings *per se* will not be disputed at all. [14] What will be challenged is the inference that such findings are evidence against the notion that monetary policy autonomy prevails under floating exchange rates. In contrast to Rey's (2016, p. 27) suggestion that "many more VARs need to be run" before the hypothesis of lack of monetary autonomy can be accepted, the perspective of the present paper is that the hypothesis would not be valid even if Rey's finding of effects of rest-of-world monetary policy shocks on domestic variables is fully granted.

This paper proceeds, in Section 2, by considering the standard argument for monetary policy autonomy under floating exchange rates, with a focus on Friedman's (1953) exposition of the argument. Characteristics of new open-economy models under fixed and floating rates are then discussed in Section 3. Sections 4 and 5 reconsider the broad evidence presented against autonomy in light of the analysis of the preceding sections. Section 6 concludes.

2. The standard argument for monetary policy autonomy under floating exchange rates

Before proceeding further, a specific characterization of monetary autonomy, and the argument that supports it, is needed.

What precisely is the monetary policy autonomy that floating rates should provide to a small open economy under full capital mobility? The answer—according to the standard case for a floating exchange rate—is that a float gives an open economy the opportunity for its monetary base to be insulated from shocks arising from abroad. A float puts the decisions that determine

[14] Nor will there be systematic discussion of the empirical evidence offered *in favor of* autonomy in Klein and Shambaugh (2015) and Obstfeld, Ostry, and Qureshi (2017), for example.

the course of the monetary base in the hands of the economy's monetary authority.[15] This is an opportunity that open economies' monetary authorities might—and, in practice, often do—use to select for their country a particular long-run inflation rate.[16]

Beyond that basic decision, the monetary authority in a floating-rate economy would likely also use its autonomy to imbue monetary policy with other country-specific characteristics. These might include the management of a particular domestic market interest rate—typically a short-term rate. In turn, the interest-rate instrument can be deployed to achieve (or to trade off, in the event of a conflict) macroeconomic-stability objectives—implying "the use of monetary policy for stabilization purposes," as Obstfeld and Rogoff (1995, p. 74) put it. Such objectives would likely include the stabilization of total output around its potential level and the limitation of movements in inflation around a long-term target. The central bank's ability to produce variations in the domestic short-term interest rate in relation to the corresponding rest-of-world interest rate arises from the monetary autonomy obtained with a floating exchange rate.[17]

Friedman's (1953) emphasis on monetary policy autonomy. The preceding autonomy argument was an important component of the Friedman (1953) case for floating exchange rates alongside full capital mobility.[18] Noting that countries that have domestic macroeconomic objectives, such as full employment and price stability, would seek "control over domestic

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[15] In actuality, central banks' market operations have predominantly been on actions that bear on the reserves portion of the monetary base, rather than its currency component. And, as discussed presently, while central banks' heavy influence on the market for reserves is crucial for their influence on interest rates, that influence has not infrequently involved devices that shift commercial banks' demand for reserves—not just measures that shift supply.

[16] In practice, the selection would need to be one consistent with the central bank's statutory mandate.

[17] Even if the open economy's central bank chose a policy instrument other than the short-term interest rate, a floating-exchange-rate regime would tend to be associated with variations in the domestic short-term interest rate in relation to global short-term rates. A specific example would be the case in which the central bank chose to make the monetary base its instrument. The central bank would be able to do this, as floating exchange rates give it prerogative over the behavior of the monetary base that it would lack under fixed exchange rates, with the float meaning that international payments flows (trade and capital) are prevented from automatically affecting the base. Even though, in this case, it would not be used as the monetary policy instrument, the domestic short-term interest rate would vary in response to domestic monetary policy actions and would accordingly tend to move differently from the corresponding interest rates in the rest of the world.

[18] The present discussion will not consider Friedman's case for floating exchange rates *in toto* but, rather, will focus on the monetary-autonomy aspect of that case. A number of aspects of Friedman's case for floating rates (such as his predictions concerning whether stable monetary policies could be counted on to generate fairly stable exchange rates and his contentions about the relationship between speculation and exchange-rate stability) have arguably not been borne out by events; yet the monetary-autonomy argument may remain valid in the face of such invalid aspects of the Friedman case. Along the same lines, one can accept Obstfeld and Taylor's (2017) contention that sizable and fluctuating capital flows have been an enduring part of the environment that floating-rate countries face—and to a far greater degree than Friedman envisioned in 1953; yet one could also view flexible exchange rates as a means of securing monetary autonomy in the presence of such capital-account fluctuations. Indeed, in his later expositions, in which he acknowledged the continuing volatility of capital flows, Friedman reaffirmed monetary autonomy as an advantage of floating rates (see, for example, Friedman and Friedman, 1984).

monetary policy" (p. 180), he observed that such control could be achieved only under arrangements in which money balances of the rest of the world were not an influence on the domestic monetary base and money stock (p. 199).[19] But, under free trade and full capital mobility, such arrangements were obtainable only under floating exchange rates.

Monetary policy autonomy implied that the domestic monetary authority had a decisive influence on the behavior of nominal economic aggregates. In particular, Friedman stressed that each individual country separately under floating exchange rates can achieve "avoidance of either inflation or deflation," and likewise "any one country" can follow a policy of inflation or deflation without that policy choice being imposed on or inherited by other countries (Friedman, 1953, pp. 198, 199).

Furthermore, under fixed exchange rates, balance of payments deficits could occur and act as a negative influence on the money stock. With prices sticky in the short run, this would create situations of deficient real aggregate demand and above-normal unemployment. Flexible exchange rates, in contrast, implied a zero overall balance of payments. This zero balance in turn made it possible for the domestic monetary authority to exercise monetary management: that is, to make policy decisions that implied a particular path for the nominal money stock and other nominal variables, such as nominal aggregate spending on goods and services. In the short run, this power also gave the monetary authority the ability to influence real aggregate demand, an ability that it might use to pursue full-employment goals (Friedman, 1953, pp. 165−167, 171).

Even in the modern day, in which a central bank's influence on the supply of monetary base tends to be deemphasized, Friedman's focus on the consequences for monetary control of different exchange-rate arrangements remains vital. That this is so is brought out by the fact that, early in the era of U.K. inflation targeting, King (1994, p. 268) noted that a central bank is well positioned to manage short-term market interest rates whether it operates primarily by changing the volume of commercial banks' reserve balances or by actions that shift the demand curve for bank reserves.[20] His argument *took for granted* the existence of a floating-rate regime. For under

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[19] Friedman (1953, pp. 181, 200, 201) referred to a monetary authority possessing autonomy as able to "create… money," achieve "currency issue," and undertake "[m]onetary expansion." These phrases, along with his contemporaneous and later writings, indicate that Friedman regarded a floating rate as conferring to a central bank control over the monetary base and, with that control, also a decisive influence over the money stock (that is, currency in circulation plus commercial bank deposits). He also noted that, under a float, key domestic interest rates were "susceptible to direct influence by the monetary authorities" (Friedman, 1953, p. 166), thus acknowledging that monetary autonomy entailed the opportunity to influence, and perhaps manage, such rates.

[20] This was the case even when Friedman wrote in the early 1950s, when one tool available to central banks was the reserve-requirement ratio, variations in which could shift commercial banks' demand curve for reserves.

a fixed exchange rate and full capital mobility, the interest rate in the market for overnight securities must take the value implied by the exchange-rate target, and the central bank must acquiesce in conducting operations that deliver that interest rate. This is true irrespective of the operating procedure of the central bank. Therefore, even when the central bank manages short-term market interest rates primarily by altering commercial banks' demand for reserves (via an interest-on-reserves policy, for example), floating exchange rates are required if the central bank's interest-rate management is to be used for domestic stabilization purposes. In this connection, Woodford (2010, pp. 43−46) analyzes the case in which the central bank manages domestic short-term market interest rates by varying the interest rate it pays on bank reserves. His analysis takes place under the assumption of a floating exchange rate.[21]

What Friedman did not say. In the context of a discussion of monetary autonomy, it is also important to be clear on what Friedman did *not* say. Such clarity is needed because recent discussions have attributed to Friedman positions he did not take. In particular, Obstfeld and Taylor (2017, p. 12), in discussing professional views on exchange rates during the Bretton Woods fixed-exchange-rate era, have stated:

"*More academic economists began to echo the early calls by Friedman* (*1953*)*… for floating exchange rates, arguing that market-determined rates would tend to eliminate external payments imbalances while insulating countries from foreign inflationary shocks. Their basic argument was that routine exchange-rate flexibility allows all countries to move to a preferred resolution of the trilemma—as compared with the situation of much more constrained policymaking that they then faced. As Johnson* (*1969, p. 18*) *put it:* '*Flexible rates would allow each country to pursue the mixture of unemployment and price trend objectives it prefers, consistent with international equilibrium, equilibrium being secured by appreciation of the currencies of* '*price stability*' *countries relative to the currencies of* '*full employment*' *countries.*'"

[21] That under fixed exchange rates a central bank must allow the domestic short-term rate to move continuously in step with the rate abroad can be seen from the uncovered interest parity condition, which implies a one-for-one relationship between domestic and foreign short-term interest rates when the expected next-period change in the nominal exchange rate is zero. In terms of domestic securities markets, the forces pushing the home rate in the same direction as the foreign rate remain present when the former rate is managed using an interest-on-reserves arrangement. This can be seen by examining the two methods of managing market interest rates analyzed in Keister (2012). Both methods he considers involve paying interest on reserves, but both also involve the central bank "setting the supply of reserve balances"—something it is not at liberty to do under a fixed exchange rate. Instead, when the exchange rate is fixed, international payments flows will steer reserve balances in a direction that makes the home short-term interest rate move in tandem with the rest-of-world rate.

The preceding passage surely implies that the Johnson (1969) quotation accurately summarizes the Friedman concept of monetary autonomy. Yet the Johnson quotation is definitely predicated on the existence of a permanently downward-sloping Phillips curve: a permanent state of affairs in which underemployment buys price stability, and in which full employment can be obtained provided that inflation is permitted. But that is not the *Friedman* position.[22] Friedman was emphatically not a subscriber to the belief that the Phillips curve was permanently downward-sloping, yet it is certainly implied by Obstfeld and Taylor (2017) that he was. It is clear that Friedman did not see floating rates as leaving policymakers free to select a long-run combination of inflation and unemployment from a Phillips-curve menu. Rather, the long-run freedom conferred by floating rates in Friedman's vision pertained only to the choice of inflation rate.[23]

In addition, the phrase "eliminate external payments imbalances" in the above Obstfeld-Taylor passage captures Friedman's position only if the "payments imbalances" in question are those of the aggregate balance of payments, not its current-account and capital-account categories considered individually. Friedman argued that a floating rate would make the overall balance of payments zero.[24] Nonzero current account imbalances (matched by nonzero capital account imbalances) under floating rates are wholly compatible with Friedman's argument.

Obstfeld and Taylor (2017, p. 15) further state: "*Early advocates of floating exchange rates like Friedman… clearly oversold the extent to which they could facilitate trade while still insulating a domestic economy from international shocks.*" Not only did Friedman not oversell the position attributed to him in this quotation, he did not even subscribe to that position. The Friedman position was *not* one in which, with a floating exchange rate, the domestic economy is wholly insulated from international shocks. Friedman stated explicitly that—under floating—international shocks would still tend to affect real variables in the domestic economy. He contended that, while developments abroad would continue to matter for the home economy

[22] The Johnson (1969) paper was apparently intended in part to "improve" upon Friedman (1953) by adding to the case for floating rates an argument drawing upon then-prevalent beliefs that the Phillips curve was permanently nonvertical, in which case a monetary authority could accept some departure from price stability to obtain full employment, run still-higher inflation to keep the economy in an overemployment situation, or choose price stability at the cost of permanent resource slack. However, such beliefs went out of favor within a few years of the appearance of Johnson's paper, in part because of Friedman's own critique of the Phillips curve. Friedman's belief in the compatibility of full employment and price stability dated back to before the appearance of his 1953 essay. See Nelson (2009, pp. 44, 70) for a detailed discussion of these matters.

[23] Friedman *did* see floating rates as making policymakers better placed to stabilize employment in the short run (see Friedman [1953, p. 158] and the passages already noted). Such a stabilization role for monetary authorities in no way implies an ability on their part to choose the long-run level of employment.

[24] This was a corollary of the fact that the monetary base comes under authorities' control with floating rates. As previously indicated, in the case of a nonzero balance of payments deficit or surplus, the external sector would be an influence on the monetary base.

under floating exchange rates, a float gave the central bank the option of preventing those developments from operating via "monetary channels," and that "monetary stability" was still possible for a country whose exchange rate floated, irrespective of the monetary policy pursued abroad (Friedman, 1953, p. 200).[25]

Friedman thus confined the variables insulated from foreign influences under floating rates to the monetary base and to the long-run behavior of nominal economic aggregates—the control of which flowed from the monetary authority's ability to influence the monetary base. The power to adjust the base also raised the possibility that the central bank could exercise a temporary influence on real series in the home economy. In particular, as indicated above, Friedman saw short-run stickiness of prices as bequeathing to monetary policy the ability to influence the course of real variables in the short run. Monetary policy then might, but need not, attempt to offset the effects of international real shocks on domestic real variables in the short run. But, due to the temporary nature of price stickiness, even a monetary policy that attempted to neutralize the short-run effects of real foreign shocks on domestic economic activity would not be capable of preventing real factors, including persistent foreign real shocks, from being decisive for the long-run behavior of real variables.

Part of this foreign influence on the home economy under floating exchange rates is on and via asset prices in the home economy. This asset-price response is one consequence of international financial integration. International financial integration is a phenomenon that needs to be sharply distinguished from monetary policy autonomy, as will be stressed in Section 4, when Rey's (2016) results are reconsidered.

Obstfeld and Taylor (2017) conclude in favor of the trilemma but, as the preceding quotations indicate, they give the impression that Friedman's argument in favor of the trilemma was mistaken and that the concept can only be salvaged using different, later arguments. Indeed, they specifically state that Friedman "erred" (p. 15) and offer as the correct position the point that "when faced with external shocks, countries with floating exchange rates still have a shock absorber that countries that peg exchange rates lack and thus can achieve preferred policy outcomes even if they cannot achieve full insulation of their economies (Obstfeld 2015)."[26] Their

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[25] In Friedman and Roosa (1967, p. 104), Friedman elaborated that a floating rate did not insulate an economy from those "external events that do require changes in the pattern of production and consumption." He observed that, in these cases, a floating rate allowed the domestic economy to undergo "adjustment to the change in real factors" abroad, albeit without (permanent) aggregate price-level movements being part of the adjustment process. See also Friedman (1953, p. 182).

[26] From Obstfeld and Taylor (2017, p. 17).

attribution of this point solely to Obstfeld (2015), a paper that does not cite Friedman, alongside the authors' negative judgment on Friedman's argument, has a clear implication: that the limited-insulation, "shock absorber" notion is one that supersedes and replaces the argument for monetary policy autonomy under floating rates given in Friedman (1953). However, as already indicated, Friedman did not make the claims attributed to him by Obstfeld and Taylor (2017), and his vision of the exchange rate's role actually mirrors the "shock absorber" function that they attribute to Obstfeld (2015). Indeed, Friedman himself on occasion used the "shock absorber" phrase to describe his conception of a floating exchange rate (see, for example, Friedman, 1975). In sum, in making the case for the ongoing importance of the trilemma and the continuing validity of monetary policy autonomy under floating exchange rates, one can rely on the standard argument for monetary policy autonomy, as outlined in particular in Friedman (1953).

3. Floating exchange rates and monetary autonomy in new open-economy models

The conditions associated with monetary policy autonomy that are predicted by the standard argument are present in formal dynamic models of the open economy. This is brought out later, when the properties of sticky-price new open-economy models under a float are discussed. As a preliminary, however, it is useful to consider the operation of floating exchange rates in flexible-price new open-economy models.

Floating exchange rates and monetary autonomy in flexible-price models. Instantaneous full price flexibility is not the environment to which Friedman's description of monetary autonomy applied. But the flexible-price case gives insights into the coexistence of international financial integration and national monetary policy autonomy under floating exchange rates.

Flexible prices in the home economy mean that the home monetary authority cannot affect the short-term real interest rate or any other real variable. In addition, home-economy short-term real interest rates will likely move closely with the rest-of-world rate. As is true of both sticky-price and flexible-price models, the uncovered interest parity (UIP) condition, once expressed in real terms, indicates that the spread between the real short-term interest rate and foreign real short-term interest rate can vary only if another term in the condition—such as the expected change in the real exchange rate, or shocks to the UIP condition—also fluctuates (doing so in a way that makes the condition hold). In the flexible-price new open-economy model of Benigno and Thoenissen (2009), for example, there are no UIP shocks and few other features in the model that occasion the real exchange rate to vary much, so domestic and foreign real interest rates largely move in lockstep.

Does the fact that, under floating rates, real interest rates in a flexible-price small open economy are insensitive to the country's monetary policy—and are typically linked closely to real rates abroad—mean that monetary policy autonomy is absent from this kind of model? The answer is no. The linkage between real interest rates across countries is a sign of financial integration—not of the absence of monetary policy autonomy. And the central bank's inability in the home economy to affect real interest rates is a manifestation not of lack of monetary policy autonomy, but, instead, of the dichotomy between real and nominal variables that is a feature of flexible-price models. The central bank in the open economy has the power to set nominal variables even in the face of their inability to affect real variables. Indeed, in Benigno and Thoenissen's (2009) model, the central bank chooses and sets the inflation rate every period.[27]

Floating exchange rates and monetary autonomy in sticky-price models. Now consider the case in which prices are sticky in the home economy. New open-economy models suggest that—depending on the precise specification of price stickiness and whether the stickiness applies to the entire price index or only to a subset of prices—the monetary authority may or may not have the ability in this environment to make the inflation rate equal to its target rate on a period-by-period basis. But irrespective of whether it can set the inflation rate every period in these sticky-price models, the central bank can set the long-run inflation rate equal to its target. Also irrespective of whether the central bank can set the inflation rate every period, it can set the nominal interest rate every period and, if desired, make it different from the rest-of-the-world nominal interest rate in any period. These generic features of sticky-price new open-economy models attest to the fact that the central bank has monetary policy autonomy under floating exchange rates in these models.[28]

Inflation-targeting central banks tend to emphasize their ability, via monetary policy actions, to make the short-term real interest rate vary, in the short run, in relation to the corresponding rate

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[27] In their model, both the home and foreign economy choose an inflation rate of zero. It would be possible, however, for the home economy to choose a different inflation rate from that prevailing abroad. Thanks to the Fisher effect, this would also imply a different nominal interest rate from that abroad, as expected inflation would differ across economies.

[28] In Woodford's (2010) model, the combination of the assumed forms of nominal rigidity, international transactions, and the consumption bundle implies that the real interest rate (at all maturities) in the home economy is equal every period to the rest-of-world rate. This is so, even though in the corresponding *closed-economy* model with nominal rigidity the central bank *would* be able to influence the real interest rate in the short run. However, as discussed presently, in other new open-economy models the domestic real interest rate can be controlled by the small economy's central bank. And, as Woodford stresses, even in his model (which is based on that of Clarida, Galí, and Gertler, 2002), the domestic central bank has monetary autonomy under floating exchange rates because it can always make the paths of the inflation rate, the nominal interest rate, and nominal aggregate demand depart from those prevailing abroad.

prevailing abroad. For example, Debelle (2017) clearly indicates that the RBA can influence Australian short-term real interest rates and can vary them in relation to rest-of-world rates.[29] In the area of modeling, Romer (2000, p. 164) argues that it is vital for a realistic characterization of a small open economy that, under floating rates, the small open economy's central bank is able to vary the short-term real interest rate in relation to the rest-of-world rate. Relatedly, Clarida (2017) and Holston, Laubach, and Williams (2017) provide empirical evidence that variation across countries in real policy interest rates might be warranted by country-specific shocks to the short-term natural real rate of interest.

In new open-economy models with floating rates, it is not a trivial matter to obtain settings in which the central bank can make movements in the real—not just the nominal—short-term interest rate differ in the short run from that in the rest of the world. However, such settings are obtainable in certain variants of the new open-economy model of Erceg, Gust, and Lopez-Salido (2010), for example. It is still the case in this environment that there is a *tendency* for the real interest rate to move in step with that abroad. But the central bank can, if it chooses, offset part or all of the influence of rest-of-world factors on the domestic real short-term interest rate by taking monetary policy actions that affect the domestic short-term interest rate (both nominal and real). The *quid pro quo* of varying the home economy's short-term real interest rate in relation to the rest-of-world real rate is that the expected change in the real exchange rate will be nonzero.[30]

Now consider a special case of the above scenario: one in which prices are sticky not only at home, but also in the rest of the world. Then the foreign central bank can affect foreign real interest rates. In addition, as already noted, there is a tendency, other things equal, for real interest rates to move in step across countries. In combination, these model features imply that monetary policy actions in the rest of the world that affect the rest-of-world real short-term interest rate will tend to produce the same movement in the short-term real interest rate in the home economy. But such a situation does not mean that the central bank in the home economy lacks monetary policy autonomy. Foreign monetary policy is a force affecting the short-term real interest rate at home; but the central bank at home can itself exert an influence on the short-term real rate, possibly in a manner that offsets foreign influences on that rate.

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[29] Similarly, in a paper written shortly after his service as Governor of the Bank of England, Mervyn King suggested that central banks can make real interest rates in their country different from rest-of-world rates in the short run (see King and Low, 2014, p. 3).

[30] This of course means that the UIP condition is satisfied.

The central bank therefore has monetary autonomy in sticky-price models with floating exchange rates. It has the opportunity to use monetary policy to set the long-run inflation rate and, thanks to sticky prices, is also able to pursue a stabilization goal for the course of real output and can influence the short-term real interest rate. By choosing monetary policy's reactions to shocks, the central bank can shape the economy's overall short-run response to domestic and foreign real shocks and can make that response different from the response that would prevail in a fixed-exchange-rate regime.[31]

The case in which there are interest rates other than the policy rate. In the sticky-price new open-economy models described above, the asset prices in the home economy that appear explicitly in the model equations are typically the exchange rate and a short-term security (the yield on which is used in the domestic economy as a policy instrument). In practice, of course, an open economy has a broader spectrum of asset prices, among them equity prices and prices of longer-term securities. Some indication of how these asset prices might be expected to behave under a floating-exchange rate-regime is therefore in order. This is especially warranted in view of the fact that, as discussed in the next section, Rey (2016) sees the behavior of broader asset prices in advanced inflation-targeting economies as inconsistent with claims that the central banks of those economies possess monetary autonomy.

The discussion here will be confined to a situation in which there is no activity in longer-term securities markets by either the home or foreign central bank. Consideration of the case of central bank purchases of longer-term securities is deferred until Section 4.

In the environment laid out above—floating exchange rates, full capital mobility, and central banks' reliance on short-term interest rate instrument—does evidence that international factors affect the domestic economy's asset prices, such as equity prices or prices of longer-term securities, constitute evidence against monetary autonomy? It would do so if the argument for autonomy claimed that, once a nation chooses to float its exchange rate, international factors,

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[31] Banerjee, Devereaux, and Lombardo (2016), for example, find that a monetary policy based on domestic goals is feasible under floating exchange rates (and full capital mobility) in their model, and they highlight one such policy that gives better economic outcomes than those prevailing under fixed exchange rates. Their conclusion does include the statement (p. 296) that "*the benefits of flexible exchange rates and inflation targeting are very unlikely to hold in a global financial environment dominated by the currency and policy of a large financial center, such as* [*in*] *the current situation…*" This statement falls into the category, noted above, of undue concessions made in the recent literature to the no-autonomy position. The Banerjee-Devereaux-Lombardo model results do affirm the existence of monetary autonomy under floating rates. The "benefits of flexible exchange rates" that the authors suggest do not hold in their model are features that are not part of the (properly stated) monetary-autonomy argument. (For example, the authors find that capital flows matter for economic activity in a floating-exchange-rate economy—a result not denied in the standard autonomy argument.)

including capital flows, affect the exchange rate but have no effect on other asset prices in the home economy. However, the standard argument does not contain this claim. As stressed above, the standard concept of monetary autonomy instead involves the more modest claim that monetary conditions can be insulated from international factors. And the phrase "monetary conditions" does not encompass all financial conditions; the phrase instead refers specifically to its power over the provision of monetary base, and in practice to the variable (typically a short-term market interest rate) that the central bank chooses to manage using that power.

As has already been indicated, the existence of international capital mobility will encourage comovement of asset prices. It is in that light that Friedman and Friedman (1984, p. 127) noted that, under floating rates, capital inflow puts downward pressure on domestic interest rates. What monetary autonomy provides is the opportunity for the central bank *also* to affect domestic interest rates. In particular, and as assumed here, a small country's central bank could undo the influence of international factors on the short-term interest rate and instead set a value for that rate, which consequently becomes the central bank's policy instrument. But for a given path of the current and expected policy rate, other asset prices in the small open economy will be function of world variables (*inter alia*), including rest-of-world monetary policy. For example, equity prices and the term-premium component of longer-term rates will likely have such a connection to world variables.

As the preceding remarks imply, monetary autonomy is perfectly consistent with international financial integration. Monetary autonomy does not mean that there are no capital flows or that those flows do not affect domestic interest rates and asset prices. A central bank concerned with managing short-term interest rates can, through its market operations, enforce its will on a particular short-term market interest rate. The central bank thereby has a considerable influence on other short-term interest rates. But both domestic and international forces will drive the overall constellation of asset prices.

Financial integration and monetary policy autonomy. It is thus evident that the case for floating exchange rates does not correspond to, or embed, a claim that a floating-rate country obtains *financial* independence from the rest of the world. On the contrary, provided that there is international capital mobility, one should observe financial integration across countries irrespective of the exchange-rate regime. This bears very much on the validity of much of the case made against the feasibility of monetary policy autonomy under floating exchange rates. We will see that criticisms of autonomy have failed to take into account adequately, in the interpretation of evidence and in associated policy conclusions, the fundamental distinction between financial interdependence and monetary autonomy. In mischaracterizing what the monetary-autonomy argument claims about floating rates, the critique has invalidly taken international influences on domestic asset prices as evidence against monetary autonomy.

In an open economy with a floating exchange rate, it is to be expected that many asset prices will largely move in tandem with asset prices abroad and will be influenced by capital flows. Such financial integration does not preclude, or constitute evidence of the absence of, monetary policy autonomy for a small country whose exchange rate floats. The evidence that has been offered that open-economy central banks lack autonomy is, at bottom, based on the invalid premise that such autonomy implies a complete disconnection of asset-price movements across economies.

Nor does the argument for monetary autonomy suggest that the exchange rate is the only variable in the economy that adjusts to shocks from abroad. The exchange-rate regime matters for how the economy responds to these international shocks. But a floating rate in itself does not insulate the economy's level of real output from the influence of international shocks in the short run, and it cannot prevent long-run adjustment of output to international shocks. Additionally, the cyclical behavior of nominal variables—like aggregate nominal spending and inflation—will likely be influenced by international shocks under a floating-rate regime. However, the central bank will be able to exercise a decisive influence on nominal variables over longer periods.

In light of the preceding discussion, let us now consider the results of Rey (2016), which she sees as evidence against the existence of monetary autonomy in floating-rate advanced economies.

4. Rey's (2016) evidence against monetary autonomy reconsidered

As stressed above, a prominent means by which central banks are viewed as exercising monetary autonomy is by managing a short-term interest rate in their economies and making decisions on that rate in light of developments in domestic economic variables. However, in contending that inflation-targeting economies lack monetary policy autonomy, Rey (2016) does not focus on relationships between policy rates. She finds only mixed evidence of effects of U.S. monetary policy shocks on other advanced economies' policy rates and downplays the worth, as a metric for judging monetary policy autonomy, of cross-country comovements of policy rates (see Rey, 2016, pp. 7, 22, 24, 26).[32] Rather, she concentrates on reactions of domestic financial variables

[32] Rey is critical of other work on monetary autonomy that centers on the cross-country connections between policy rates. Indeed, her criticism includes the curious statement (Rey, 2016, p. 24): "*The trilemma, by focusing exclusively on the interest rate, seems to miss a potentially important channel of transmission of monetary policy in*

other than the policy rate in arguing that advanced economies lack monetary policy autonomy. Specifically, Rey (2016) conducts a vector autoregression (VAR) analysis of the effects of U.S. monetary policy shocks on key variables in several inflation-targeting advanced economies: the United Kingdom, Canada, Sweden, and New Zealand. In what she regards as a contrast with the notion that these nations' central banks can achieve domestic objectives under a float, she finds that financial variables other than the policy rate respond to a U.S. monetary shock.

In evaluating this evidence, it is worth beginning with one domestic variable that, although it is not actually included in her VAR analysis, Rey (2016, p. 10) highlights as affected by foreign factors (specifically, by U.S. monetary policy): credit growth. She stresses that credit growth in floating-rate open economies is influenced by international factors, operating via capital flows. However, it is almost a truism that a capital inflow will increase a country's credit growth irrespective of exchange rate regime, and this truism can hardly be regarded as evidence against monetary autonomy. A net capital inflow will tend to increase a country's overall external liabilities; and, usually, part of this increase in liabilities will take the form of lending to the country from abroad. Therefore, *ceteris paribus*, capital inflows will tend to increase credit growth in the domestic economy. Under floating rates, the existence of this mechanism does not imply lack of monetary autonomy on the part of the home economy's central bank. On the contrary, under floating rates the capital inflow does not add to the monetary base and so does not compromise the central bank's ability to manage short-term interest rates.

Rey (2016, p. 13) nonetheless sees capital flows as violating monetary autonomy for the following reason: "*As capital flows respond to U.S. monetary policy, they may not be*

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international markets." The reason this statement is curious is that the Mundell (1963) article cited by Rey as a key reference on the trilemma actually presented a model in which the monetary authority had *no* ability to influence interest rates under floating rates (a setting also described in Fleming [1962, p. 372]). The Mundell (1963) reference is therefore alone sufficient to establish that the trilemma concept and the literature associated with it cannot be regarded as "focusing exclusively" on interest rates.

In a similar vein, Rey (2016, p. 7) specifically states that in the Mundell-Fleming model a floating exchange rate gives the central bank the power to control domestic interest rates. However, as already noted, this feature is actually absent from the Mundell-Fleming model under full capital mobility. In that setting, interest rates never differ from those abroad irrespective of exchange rate regime. In early work by Mundell (such as Mundell [1960, 1961]) a small open economy used the interest rate as its policy instrument, but his most celebrated contributions in the 1960s on the flexible-rate/fixed-rate distinction did not treat the interest rate as chosen by a small economy's central bank. (Indeed, in Mundell and Swoboda [1969, pp. 262–263], Mundell actually repudiated the practice of treating the interest rate as a policy instrument in an open economy.) It was not Mundell but other authors (including Friedman, as indicated above, and many contributors to the more recent new open-economy literature) who associated monetary autonomy with the ability of the central bank to influence the (or an) interest rate.

All this said, it is indeed the case that caution is needed in considering research that judges the existence or extent of monetary policy autonomy on the basis of cross-country correlations of policy rates. Such work has limitations discussed in Section 5 below.

appropriate for the cyclical conditions of many economies." But such a scenario actually has no bearing on the matter of monetary policy autonomy. An influence of capital flows on the domestic economy's business cycle is a case in which a development other than domestic monetary policy affects aggregate demand. It does not imply that the central bank is not itself incapable of affecting (real and nominal) aggregate demand. Provided that the central bank has this capability, it can, if it desires, take actions that offset other forces, including capital flows, affecting aggregate demand. That is, under floating exchange rates, the central bank is able to set the short-term nominal interest rate in response to the economic outlook, including any impact that capital flows have had on the outlook. Furthermore, and in contrast to the fixed-rate case, the central bank under floating rates is able to decide, via its monetary policy response, whether capital flows are permitted to have any lasting influence on nominal variables.

Let us now consider the key domestic financial variable (other than the policy rate) included in Rey's (2016) VAR analysis.[33] This is the "mortgage spread"—defined as the spread between the mortgage interest rate and the long-term government bond rate.[34]

Central banks in open economies certainly tend to take the position that the mortgage interest rate is an important interest rate on which their own actions have considerable influence. Rey's results do not, however, actually contradict this position. She finds that U.S. monetary policy shocks are one factor affecting the spread between the mortgage interest rate and the long-term government bond rate. Nothing in this result precludes the domestic central bank's monetary policy from being an important factor affecting the *absolute level* of mortgage interest rates.

With regard to long-term government bond rates themselves, these—like equity prices—fall into the category of domestic asset prices that one would expect to be influenced by world conditions, including U.S. monetary policy shocks, even when the exchange rate floats and the central bank has monetary policy autonomy. This point is elaborated on below. For the moment, it is sufficient to note that nothing in Rey's results is inconsistent with the notion that longer-term rates are *also* affected by domestic factors, including the actions of the home central bank.

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[33] Other than financial variables, Rey (2016) also shows responses to U.S. monetary policy shocks of inflation-targeting countries' output and consumer price index. As monetary autonomy refers to the insulation of base money from foreign monetary shocks, not the insulation of all the economy's variables, it is consistent with monetary autonomy that output is responsive to international shocks (including, in the short run, foreign monetary policy shocks that affect real asset prices and output in the foreign economy). And while, under monetary autonomy, it is possible for monetary policy to make nominal variables such as the CPI immune from foreign influences over long periods, autonomy does not imply that the CPI and CPI inflation are insensitive to international shocks in the short run.

[34] Rey (2016, Appendix II) also considers responses of the exchange rate.

In sum, Rey's (2016) empirical findings are consistent with financial integration of the kind that one should observe when a small open economy possesses the features of international capital mobility, floating exchange rates, and monetary policy autonomy. It follows that results indicating that movements in asset prices in the economy are linked to those in the rest of the world does not constitute evidence against that economy's monetary policy autonomy.

Rey (2016, p. 13) states: "*Although seeing a lot of comovement in asset prices worldwide may just be reflecting market integration, the fact that these comovements are to some extent caused by U.S. monetary policy is important.*" Such comovements and their source may indeed be important. But these factors do not refute the existence of monetary policy autonomy. Their existence does not prevent the home central bank from affecting the actual real policy rate. The central bank is then in a position to reinforce, accommodate, or offset international shocks that affect the domestic economy's level of aggregate demand. In Wicksellian terms, international shocks are among the factors determining the natural value of the real policy rate in the domestic economy: such shocks affect the value of the actual policy rate consistent with keeping output at potential. But they do not prevent the home economy's monetary policy, as reflected in its chosen value of the policy rate, from influencing aggregate demand.

Long-term interest rates and asset purchases. Although Rey (2016) considered the international effects of a conventional U.S monetary policy shock, the validity of the trilemma has also been discussed in the context of the Federal Reserve's large-scale asset purchases.[35] As is well known, these purchases, which took place principally from 2008 to 2014, were an unconventional monetary policy operation initiated by the Federal Open Market Committee (FOMC) and consisted of acquisitions of U.S. longer-term government securities, made with the intention of lowering the term premiums in the interest rates on these securities.[36] It is worth laying out how the notion of monetary autonomy in floating-rate, small economies endures in the presence of asset purchases by a large economy's central bank. In what follows, it will be taken for granted that asset purchases are indeed capable of lowering term premiums.

Because of global trading in securities, the behavior of U.S. longer-term interest rates is likely one influence on longer-term interest rates in smaller countries. Therefore, in the presence of asset purchases, foreign central bank purchases likely become one of the factors affecting domestic as well as foreign term premiums. This is a way in which foreign monetary policy

[35] See, for example, Taylor (2016, p. 242).
[36] Such a lowering was designed to provide stimulus to aggregate spending and so help bring U.S. economic outcomes closer to the FOMC's statutory objectives.

actions matter for the behavior of domestic long-term interest rates even when the exchange rate floats and short-term interest rates at home are set by the domestic monetary authority.

Does such an influence of foreign monetary policy on domestic longer-term interest rates imply a violation of monetary policy autonomy? The answer is no. For one thing, the monetary base is still insulated from foreign influences, and the central bank in the home economy can still make use of that situation to control the short-term interest rate. But suppose—to take an extreme case—that the long-term interest rate in the domestic economy is the *only* interest rate or asset price that matters for aggregate demand in the open economy. In the presence of an influence of foreign monetary policy on this rate, it is still the case that there is monetary policy autonomy, because the home central bank is *also* able to influence the longer-term rate. As usual, the longer-term rate can be decomposed into an expectation of the path of the short-term interest rate (which, by assumption, is the policy rate) and a term-premium component. See Figure 1.

The term premium is in turn affected by domestic and international factors. These international factors include the foreign central bank's asset purchases (that is, purchases by the foreign central bank of securities issued by the government of its own country—purchases that produce a reaction of foreign term premiums that transmit into an influence on domestic term premiums). But the central bank in the domestic economy can itself affect longer-term interest rates at home through two means: by affecting the expected path of its policy rate and by its own asset purchase program. By such means, the central bank can affect aggregate demand even when the long-term interest rate is the key interest rate for aggregate demand and when the long-term interest rate is partially determined by international factors.

5. Interrelations of policy rates across countries

Let us now return to the situation in which monetary policy is centered on management of a short-term interest rate. A great deal of research on testing and indexing monetary policy autonomy focuses on the strength of the correlations of short-term interest rates across countries under different exchange-rate regimes.[37] For example, Edwards (2017, p. 10), like many others, notes that lack of monetary policy autonomy corresponds to a situation in which a small country's policy rate must keep in step with the short-term nominal interest rate prevailing in the rest of the world, and his tests of monetary autonomy rest on the premise that autonomy is associated with statistical independence of the home policy rate and the rest-of-world rate. The

[37] For an early study in this vein, see Throop (1980).

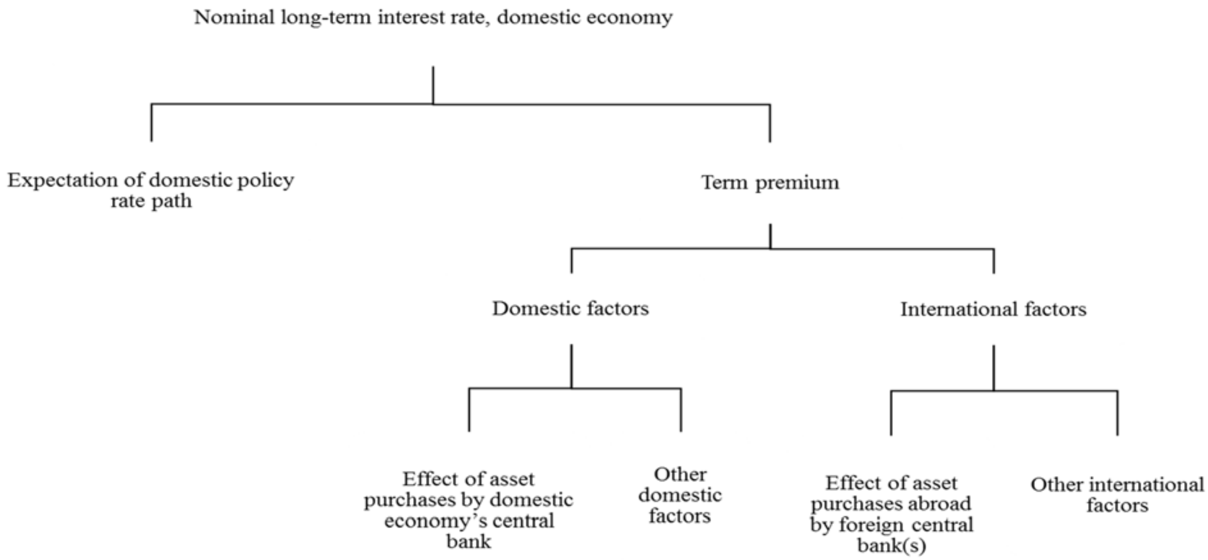

Figure 1. Influences on the nominal longer-term interest rate in a small open economy.

same notion underlies such investigations as Aizenman, Chinn, and Ito (2008) and Klein and Shambaugh (2015).

There are, however, grounds for believing that, outside the extreme cases of correlations of zero or unity, positive correlations of policy rates across countries are not informative about the degree of monetary policy autonomy. To be sure, a perfect or near-perfect positive correlation of a small country's policy rate with the policy rate abroad is very likely testament to fixed-exchange-rate conditions (formally or *de facto*) and to a corresponding lack of monetary autonomy. And the ability of an open economy's central bank to make its policy rate wholly uncorrelated over long periods with that in economies abroad does point to the likelihood that it possesses monetary autonomy.

In contrast, the intermediate case of an imperfect positive correlation is unlikely to be informative about autonomy. Evidence that, under capital mobility and floating rates, policy rates are correlated across countries, or evidence that the domestic policy rate responds to foreign variables, does not in itself amount to a refutation of the existence, availability, and practical importance of monetary policy autonomy in small open economies whose exchange rates float.

To see this, it is useful to put aside the case in which the small open economy's central bank decides to follow a monetary policy strategy not solely oriented toward domestic aggregate goals. This case includes the possibilities that the central bank implements a managed exchange-rate float or responds to developments in the trade sector—as Bernanke (2015) argues might be the situation in some emerging economies. Such possibilities will be bypassed as they are unlikely to pertain to the advanced economies—focused upon here—that target inflation and float their exchange rate. The monetary authorities in these latter economies likely instead fit Debelle's (2017) characterization of being concerned with "very much domestic" objectives.

In the case of these domestic-objectives-focused economies, a positive correlation between policy rates and those abroad might emerge under monetary autonomy for two basic reasons. First, there could be policy-rate responses to international shocks that matter for—and might tend to destabilize, absent an appropriate policy response—domestic variables like inflation or the output gap.[38] Second, a positive correlation could arise from the central bank's response to shocks to domestic spending and production that have an international component, in the sense of being correlated with the corresponding shocks elsewhere. For example, taste or technology shocks might have a global component.

The point that a policy strategy focused on domestic economic stability might involve responses to global shocks has been occasionally acknowledged, but not stressed, in some studies that focus on policy-rate correlations in judging the validity of the trilemma (see, for example, Klein and Shambaugh, 2015, p. 38). It receives more emphasis in Obstfeld (2015, p. 14), although the shocks possessing a global component likely go beyond the financial shocks that Obstfeld nominates as candidates.

The reasoning outlined above implies that, even though monetary autonomy can make an open economy's policy rate statistically independent of policy rates abroad, a positive, but imperfect, correlation with policy rates abroad need not signify the absence of monetary autonomy.

6. Conclusion

In a closed-economy model, the monetary authority is able to exert a decisive influence on the

[38] Such a domestic policy response to international shocks might be brought about via the policymakers' belief in the importance of the exchange rate for the behavior of domestic variables. For example, King (1997, p. 227) observed that in U.K. inflation targeting, exchange-rate behavior was "an important component of our assessment of the economy and the prospects for inflation."

course of nominal variables in the long run and, if there is price stickiness that wears off over time, it is also able to influence the course of real variables in the short run. If a small economy's central bank in an open-economy model has these same abilities when it lets its exchange rate float, then it is appropriate to conclude that the central bank in that model has monetary policy autonomy under a float. It has been argued above that the central bank does have such autonomy under floating rates in standard new open-economy models and that, furthermore, this autonomy is of practical relevance for the understanding of policy behavior and economic outcomes in floating-rate, inflation-targeting advanced economies.

Monetary autonomy for a central bank, as expounded by Friedman (1953) in his case for floating exchange rates, means that the central bank has prerogatives regarding the creation of the total amount of base money, irrespective of the monetary policy pursued abroad. A corollary of this is that, for a small open economy whose exchange rate floats, variations in trade balances, in capital flows, or in monetary developments abroad have no automatic implications for the path of the monetary base. Consequently, the economy's central bank is in a position to use its influence over base money to pursue stabilization policies (typically, in practice, via the management of a short-term interest rate). That condition holds under floating exchange rates in actuality, as well as in sticky-price new open-economy models under the assumption of floating.

Monetary autonomy does not imply that asset prices at home (including interest rates other than the policy rate) are insensitive to international factors, including developments in monetary policy abroad. On the contrary, everything else equal, financial integration will create tendencies for real yields in the home economy to move closely with those in the rest of the world. When prices are sticky in the rest of the world, foreign monetary policy will be one influence, in the short run, on rest-of-world real yields and so on domestic real yields, without any violation of monetary autonomy in the home economy.

In light of these properties and implications of monetary autonomy, it is clear that empirical evidence like that recently offered as evidence against the practical importance of monetary autonomy does not, in fact, amount to valid evidence against autonomy. As this paper has stressed, empirical findings put forward as contradicting monetary autonomy—such as the influence of foreign monetary policy shocks on domestic asset prices—are, in qualitative terms, features that can be found in new open-economy models in which the monetary authority possesses autonomy under floating exchange rates and complete capital mobility.

Rey (2016) finds that U.S. monetary policy shocks affect asset prices and other financial conditions in advanced inflation-targeting economies. Such evidence confirms that foreign monetary policy likely is one of the sources of international shocks that affect output and aggregate demand in open economies. But, as indicated above, monetary policy autonomy does not require that the domestic economy is unaffected by shocks abroad, including, in the short run, foreign monetary policy shocks. It only requires that the central bank at home is itself able to affect the domestic economy by influencing aggregate demand.

Edwards (2017) and others find that policy rates in small open economies are related to those abroad, even under conditions of floating exchange rates. But, as has also been indicated above, although a float leaves the central bank able to make the policy rate vary in relation to those prevailing abroad, its pursuit of domestic objectives may lead it, on occasion, to make the policy rate move with rest-of-world rates. Consequently, although a lack of correlation between the home policy rate and that abroad may be testament to monetary autonomy in the home economy, a significant positive correlation can be consistent with the operation of an autonomous monetary policy, directed at domestic objectives, in that economy.

The analysis given here reaffirms the standard result that if an open economy floats its exchange rate, it secures monetary policy autonomy. Controls on international capital movements are not needed for autonomy. The result that monetary autonomy prevails whether capital controls are imposed or not does not, of course, mean that financial conditions in the home economy are the same with or without such controls. On the contrary, capital controls modify—and likely reduce—the influence of rest-of-world developments on asset prices and on other financial conditions in the home economy. It is possible that the authorities of an open economy could see merit, on net, in such a situation—perhaps on financial-stability grounds.[39] Nevertheless, such considerations do not bear on the validity of the dilemma/trilemma distinction—which pertains to monetary policy's power. The linkage between the economy's asset prices and those in the rest of the should be clearly distinguished from the central bank's ability to carry out a stabilization policy that shapes the path of aggregate demand and inflation. Provided it has that power in a floating-rate setting (even without capital controls), a central bank in an open economy does possess the monetary policy autonomy described by the trilemma.

[39] It is tempting to add that, as asset prices are among the factors that influence aggregate demand, capital controls imply enhanced scope for the authorities to affect aggregate demand. Such an enhanced scope is not very meaningful, however, if monetary policy is itself capable of affecting aggregate demand. Provided that the latter condition holds, the presence of capital controls might imply that there are fewer forces that monetary policy needs to offset to stabilize aggregate demand. But the ability of monetary policy to stabilize aggregate demand is present under floating rates irrespective of whether capital controls are imposed.

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