Robert A. Mundell: A Profile

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Abstract

This essay is a short introduction to the work of Robert A. Mundell, winner of the Nobel Prize for Economics in 1999. It is a contribution to a special issue of *Review of International Economics*.

1. The Person

Robert Alexander Mundell is originally from Canada and completed his undergraduate studies at the University of British Columbia. He then went on to graduate studies in Economics at the London School of Economics and the Massachusetts Institute of Technology, receiving his PhD from MIT in 1956.

In addition to working at the International Monetary Fund, Robert Mundell has taught at Stanford University, the Johns Hopkins Bologna Center of Advanced International Studies, and the University of Chicago. Since 1974, he has been a professor at Columbia University. Until 2001, he held the title of C. Lowell Harris Professor of Economics at Columbia. In 2001 he was named University Professor by Columbia, the highest honor bestowed by Columbia to its faculty.

2. The Prize

The Nobel Prize Committee’s announcement states that Robert Mundell was awarded the prize in economics “... for his analysis of monetary and fiscal policy under different exchange rate regimes and his analysis of optimum currency areas.” Let me briefly elaborate on these two aspects of his work.

The first brought about a fundamental insight that remains at the core of current discussions of monetary policies. Specifically, with international capital mobility, monetary policy can be chosen either to achieve domestic objectives, such as targeting inflation rates, or to achieve external objectives, such as targeting an exchange rate. However, it cannot be used to target both internal and external objectives at the same time. As he states in a recent *Wall Street Journal* article: “The combination of pegged or pseudo-fixed exchange rates with an independent monetary policy is no doubt the worst of all exchange-rate systems. Because there is no mechanism of adjustment it is doomed to destruct from the start” (Mundell, 2000). All major international currency crises can at their core be attributed to the failure of governments to heed this advice.

The second main contribution is in Mundell’s defining of an optimum currency area as one based on regions within which factors are mobile, rather than one based on national boundaries. This work has provided the framework within which discussions for the creation of the European Monetary Union have been based from the very beginning.

Perhaps what is most impressive about the research completed by Robert Mundell is that it considered an environment that did not exist at that time. In the early 1960s

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when he was developing his research, fixed exchange rates were the rule and flexible exchange rate regimes were rare (except for Canada, of course). Hence his analysis of monetary and fiscal policy under both flexible and fixed exchange rates might have appeared to be based purely on academic curiosity. His introduction of a formal modeling of international capital flows into discussions of monetary policy and exchange rate policy had not been considered before. This new framework opened the door to the creation of open-economy macroeconomics as a new subfield within international economics. Similarly his analysis of the optimality of currency areas not based on national boundaries most likely appeared quite abstract and unrealistic so soon after the Second World War. Yet, it was prophetic as we have witnessed since what most would have thought never to be possible, namely the creation of a single currency within the European Monetary Union. Let me take up the theory of optimum currency areas first.

3. Optimum Currency Areas

Robert Mundell “. . . recalled that the older economists of the nineteen century were internationalists and generally favored a world currency. Thus John Stuart Mill (1894) wrote:

So much of barbarism, however, still remains in the transactions of most civilised nations, that almost all independent countries choose to assert their nationality by having, to their own inconvenience and that of their neighbors, a peculiar currency of their own (p. 176).”

His visionary statement: “The optimum currency area is the region” (Mundell, 1961, p. 660) has been validated by history. If at that time, it “hardly appears within the realm of political feasibility that national currencies would ever be abandoned in favor of any other arrangement,” the question is not “purely academic.” His detailed plan for a European currency (Mundell, 1973b) is thus prophetic, foreshadowing the introduction of the euro by 26 years. In his words:

The theory of international trade was developed on the Ricardian assumption that factors of production are mobile internally but immobile externally. . . . I have tried to show that its relaxation has important consequences also for the monetary theory of trade and especially the theory of flexible exchange rates. The argument for flexible exchange rates based on national currencies is only as valid as the Ricardian assumption about factor immobility. . . . A dilemma now arises: . . . regions ought to be defined so narrowly as to count every minor pocket of unemployment arising from labor immobility as a separate region, each of which should apparently have a separate currency! (Mundell, 1961)

Notice that the issue is factor mobility, not just narrow labor mobility. Indeed, in a justly celebrated paper on the relationship between factor mobility and international trade, Mundell (1957) showed that trade and factor mobility are perfect substitutes. Consequently, when trade barriers arise, factors of production leap over the trade barriers and produce locally the good that would otherwise have been imported. In his terms:

The absence of trade impediments implies commodity-price equalization and, even when factors are immobile, a tendency toward factor-price equali-
zation. It is equally true that perfect factor mobility results in factor-price equalization and, even when commodity movements cannot take place, in a tendency toward commodity-price equalization.

Transactions costs also play an important role in Mundell’s theory of optimum currency areas:

Money, in its role of medium of exchange, is less useful if there are many currencies; although the costs of conversion are always present, they loom exceptionally large under inconvertibility or flexible exchange rates. (1961)

He also put forth in 1973 a novel argument for common currencies in terms of risk-sharing and consumption smoothing. He argued:

Consider a world of two islands, one south of the equator, Capricorn, and one north of the equator, Cancer. Both islands can produce a single crop of perishable food each year, but Capricorn’s crop ripens in the autumn and Cancer’s crop ripens in the spring. Food in each island can be stored for up to six months, after which it is unfit for human consumption. . . . Let us . . . suppose . . . that the world population is divided equally between the two islands and that there is no mobility between them; transport costs are infinite. If there were no inter-island shipping of food the populations would die out. For half the year the population of each island would be without food, so eventually each island would be without population. . . .

The population of each of the islands is dependent for its survival on the population of the other. We want to explore now the nature of the credit instruments or financial arrangements by means of which the exchange necessary for survival takes place. . . . Let us suppose that both Cancer and Capricorn respectively produce one hundred units of food in the spring and autumn. In the spring Cancer ships half its crop to Capricorn, but what does it receive in exchange? It must receive an evidence of Capricorn’s debt, a claim to part of Capricorn’s wheat crop maturing in the autumn. Who produces the claims?

Suppose that in the previous autumn when Capricorn’s crop was maturing, the government of Capricorn issued money to Capricorn’s citizens in exchange for half of Capricorn’s crop, where the money received was interpreted by Capricornians as an equivalent claim to food in the spring. To make good on the claim the Capricorn central bank has to acquire a claim on half of Cancer’s spring crop. Now if in the autumn the Cancer bank issues claims to Cancer spring wheat to the Capricorn bank in exchange for current autumn wheat, the arrangement can be completed when the Capricorn bank delivers the autumn wheat to the Cancer bank (in return for Cancer notes), and the Cancer bank sells the wheat to Cancerians to redeem previously issued Cancer notes. . . .

This arrangement would function satisfactorily in a world of certainty in which crops were known in advance and no defaults were made on the redeemability of currencies. But in a world of uncertainty it would be subject to speculation about the convertibility of foreign currencies. . . .

The important point to recognize . . . is that when there are different currencies the threat of devaluation introduces an additional element of uncertainty into the system. Each country depends on the other but the producer
of the current crop calls the tune in the short run even though, in the situation under analysis, the ability to exploit this opportunity is limited by international symbiosis in the long run. Forward exchange transactions are of no help either because they lack credibility when major disruptions occur. In the case under consideration there would be strong incentive for the two countries to establish in advance a set of rules or laws—a monetary order—for the sharing of the gains and losses of fluctuations in the harvest.

A common money performs the sharing function very effectively. Suppose that the two countries agree to the creation of a common currency. Before the spring harvest Capricorn puts into a world bank 50 units of the claims it holds on Cancer’s spring crop, and gets in exchange 50 units of world money. When the spring crop emerges the Capricornians use their world money to buy 50 units of Cancer money from the Bank of Cancer (which has agreed to accept world money) with which they buy half the spring crop; and then the Cancerians exchange their 50 units of Cancer money for 50 units of world money. . . .

At this point there will not appear to have been a gain to the system as a whole by the amalgamation of the two monies. But the gain appears when the variability of the crops is taken into account. For example, suppose again that the spring crop in Cancer is below the average, let us say at 70 units. Then Capricorn consumers hold 50 units of the world money as do Cancer producers. As long as competition prevails and there are no delays in the transmission of goods or information the 100 units of world money will exchange for the 70 units of food irrespective of who holds the money; this is because competition and freedom of arbitrage assure the single price. The price of a unit of food thus rises to 100/70 for both Capricornians and Cancerians and the burden of the harvest fluctuation is met equally by the two islands. The common currency assures an automatic and equal sharing of the risk of the fluctuations. (1973a)

The ability to redistribute the burden of random fluctuations through time comes from the automatic borrowing and lending mechanism in a currency union. In the same article, Mundell also demonstrates that, as the size of the currency union rises, the optimal reserve holdings fall as the number of transactions outside the union diminishes. Economies of scale in reserve holdings via the pooling of reserves thus represent lower seigniorage costs paid to reserve currencies. Mundell further proposes a

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<th>Table 1. Mundell’s Principles, Instruments and Examples</th>
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<td><strong>Principle</strong></td>
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Source: Author’s construction, based on Mundell (1973a, table 7.1).
liquidity index based upon the advantages of using international reserves as a shock absorber. He defines the liquidity index as \( \sigma = \frac{\text{Reserves}}{\text{Imports}} \times 12 = \text{number of months' imports held in reserves.} \) He solves for an optimal \( \sigma = \frac{12}{V} = \frac{12}{\text{Income velocity of money}} \). Consequently, if income velocity is 4, the optimal liquidity ratio equals reserve holdings of three months’ of imports.

To summarize his various arguments for common currencies and indicate practical examples, I reproduce Mundell’s table opposite (Table 1), adding in italics current examples foreshadowed by him.

4. Policy: Internal and External Balance in the Open Economy

In March 1962, Robert Mundell published a pioneering macroeconomic policy paper using two instruments, monetary and fiscal policy, to attain two objectives, internal and external balance. Here, I think James Meade (1951) had an influence on Mundell, along with Jan Tinbergen (1952). However, the motivating force for the contribution and its dramatic policy impact resulted from the policy struggle between these two objectives in a context where macroeconomists were incorrectly arguing that it was impossible to achieve both objectives simultaneously with macroeconomic policy. Once again, Mundell opened the policy world to capital mobility in the famous so-called Mundell–Fleming model. (Parenthetically, Mundell has never coauthored a paper with Marcus Fleming. Fleming was influenced by Mundell’s work and developed it in different directions.)

Introducing capital mobility made all the difference. In a fixed exchange-rate regime, “a surplus country experiencing inflationary pressure should ease monetary conditions and raise taxes (or reduce government spending), and . . . a deficit country suffering from unemployment should tighten interest rates and lower taxes (or increase government spending)” (Mundell, 1962). Figure 1 shows Mundell’s diagrammatic composition of policies to achieve internal and external balance. The targeting of monetary policy (as indicated by movements in the interest rate) towards the attainment of the external balance schedule FF, and fiscal policy (as indicated by changes in the budget surplus) to attain internal balances as indicated by XX, represents a dynamically stable mix of policies to simultaneously attain internal and external balance.

This dynamically stable policy mix is indicated in Figure 1. It relies upon capital mobility to give monetary policy the comparative advantage in external balance and fiscal policy the comparative advantage in internal balance. Perhaps no other diagram has entered policy discussion and had such an impact on policy in this century.

Of course, Mundell generalized this model to flexible exchange rates and monetary and fiscal policy in an open economy under both regimes in the presence of capital mobility. These writings became the foundation for open-economy macroeconomics for generations of graduate students in international economics worldwide. They are also justly cited in the December 1999 Nobel Prize announcement.

Another major contribution by Mundell was made in the *Journal of Political Economy* in 1965 when he was at the University of Chicago. Returning to the Fisherian (1954) equations, he argues that the real rate of return must decline as individuals are forced to save more in order to maintain desired real cash balances in the face of inflation. The *Mundell effect* on the real rate of interest has become part of the fabric of modern macroeconomics.

In an extension of the *Mundell effect* to deficit finance and growth, Mundell examines the upper bound on the increase in real growth that could be achieved by inflationary finance of fiscal spending. His results suggest:
[It] is clear that the upper limit on growth is $3/200 = 0.015$ or 1.5 percent, and that this is associated with an infinite inflation. Indeed, to achieve a half-percent increase in the real growth rate would require approximately 15% inflation, and a 1 percent increase in growth would require nearly 60% inflation. These modest gains do not include losses associated with inflation uncertainty and volatility that typically accompany high inflation.

In the same 1965 article, Mundell applies powerful artillery to solve the problem of stopping inflation. Here he analyses the dynamic stability of shock therapy, “ending money expansion abruptly,” versus discrete gradualism, reducing the rate of monetary expansion in proportion to the rate of inflation.

While he derives a gradual rule which will not involve unemployment in the adjustment process, he suggests that it will be difficult to establish parameters for this rule.

[So] the problem of stopping inflation must involve considerable guesswork. Perhaps the safest rule is to abandon the exceedingly delicate goal of precisely stabilizing the price index and planning instead on moving to price stability at a somewhat higher price level. The longer the time for stabilization, the higher the ultimate price level, a factor in setting new exchange

Figure 1. On the Appropriate Use of Monetary and Fiscal Policy for Internal and External Balance. Source: Mundell (1962).
rates. But the opposite danger is more severe. If the monetary authorities’ expansion is ended too abruptly, the ensuing depression can discredit the entire process. (1965)

5. International Trade

No review of Robert Mundell’s work would be complete without mentioning his many contributions to the theory of international trade. Starting with the pure theory of international trade, Mundell rigorously demonstrated trade propositions using the Samuelson (1953) method of comparative statics, the conditions of stability, and Mill–Marshall–Meade offer curves. In a context of two countries, A and B, Mundell summarizes his major findings (1968):

1. Stability requires that a fall in A’s terms of trade improve A’s trade balance, so the system is stable or not depending on whether the sum of the elasticities of demand for imports is greater or less than 1 . . . (p. 13)

2. [A unilateral] transfer creates an excess demand for, or excess supply of, the good of the transferring country depending on whether the sum of the marginal propensities to spend on imports is greater or less than 1. (p. 18)

3. [The] real income of the receiving country will be lower following a transfer, only if the system is unstable. (p. 21)

4. Tariffs normally improve the terms of trade. (p. 27)

5. A tariff raises the domestic price of imports if the sum of the foreign elasticity of demand for imports and the domestic marginal propensity to import is greater than 1. (p. 30)

6. . . . a consumption tax on the imported good generally improves the terms of trade of the taxing country. (p. 34)

7. If a tariff will raise the domestic price of imports, so will a consumption tax on the import good. (p. 36)

8. A tariff reduction in a member country unambiguously improves the terms of trade of the partner country [in a customs union or a free-trade area.] (p. 58)

9. Some sets of tariff reductions necessarily improve the terms of trade of both member countries with respect to the rest of the world. (p. 59)

10. In the . . . absence of trade impediments, trade is sufficient to ensure commodity and factor-price equalization. (p. 96)

11. [Following the imposition of a tariff on imports of capital intensive goods, with] perfect factor mobility of capital, capital flows in until the marginal products of both labor and capital [are] equalized in both A and B. . . . Marginal products and prices can only be equalized in A and B when A’s imports cease . . . due to local production of the capital intensive good. . . . The tariff has eliminated trade, but after the capital movement there is no longer any need for trade. (pp. 88–9)


In Paul Krugman’s terms, “Robert Mundell is surely the [supply-side] movement’s intellectual luminary” (Krugman, 1994). In a series of Wall Street Journal articles authored by Robert Mundell, the case for the Reagan tax reform of 1986 was argued, and the importance of incentives and consistency in tax policy was made. Occasionally, Mundell made the Mill case for a universal currency, possibly using the gold standard as a vehicle because it provides both an anchor and a fix, but more importantly a
common currency. In an editorial, *The Wall Street Journal*, a long-time supporter of Robert Mundell, put it well and with passion:

All the world loves a winner, and it’s good to see praise rolling in from all quarters for supply-sider Robert Mundell, who has just won the Nobel Prize for economics. It is clear, however, that there are still some economic experts out there who think the Nobel is nifty, but haven’t quite caught up with the full reason why Mr. Mundell deserves this honor in economics. They want to love the laureate, but deny his supply-side tax-cutting ways. The result in recent days has been a lot of white noise from some deeply confused columnists who would like to argue that Mr. Mundell’s great contribution to mankind has been, for example, his interest in the economy of his native Canada.

With due respect to Canada, such delicate praise misses the basic point. The core of what makes Mr. Mundell’s work so valuable is not that he knows equations, or thinks in particular about Canada, or Europe, or exchange rates, or taxes—true though all that is. What makes Mr. Mundell’s work vital is his grasp of what motivates human beings, and how they interact in markets. His vision starts with the understanding that the less people are forced to contend with arbitrary meddling by governments—whether by way of unsound money or high taxes—and the more they are allowed to plan securely and keep the proceeds of their own work, the more innovative and productive they will become. And the richer the world will be.

Mr. Mundell began exploring such visions decades back, when high fashion in economics was to believe that governments knew better than individuals how to make the economy thrive. This was the Keynesian view of the world in which government officials were supposed to hover Wizard-of-Oz-like over the controls, working the bells and whirligigs of things like deficit spending, and somehow this would bring general bliss.

Mr. Mundell’s genius was to simply set aside the Keynesian contraption, and forge ahead on the assumption that this is an interconnected world economy, not unrelated national planets. Thirty years ago, such ideas earned him ridicule. It’s a serious sign of world progress that earlier this month, these same ideas earned him the Nobel.

When Ronald Reagan took office, Mr. Mundell was among those who argued that lower taxes would bring higher growth, which would eventually erode the federal deficits that so flummoxed folks of the high-tax creed. Mr. Reagan listened, and cut taxes. The result was the long boom that with the exception of a brief recession in the early 1990s has now rolled on for two decades. The economy has, by the way, outgrown those high-tax Keynesian deficits, as Mr. Mundell predicted, and politicians now are boasting about surplus.

For those economists who cling to a Keynesian worldview, and see supply-side thought as an affront to their own interest in micro-managing us all, this Mundellian vision and foresight can be confusing. Contrast Mr. Mundell’s prophetic accuracy, for example, with a memo co-authored back in 1982 by two of the world’s more enduring Keynesians: Lawrence Summers, now Secretary of the Treasury, and Paul Krugman, recently named a New York Times columnist. Addressing the Administration early
in the Reagan era, Messrs. Krugman and Summers somberly warned that the way things were going, the country was headed for a weak dollar and “a significant reacceleration of inflation in the near future.”

Not exactly. As we now know, the supply-side era of Mundellian theory and Mr. Reagan’s legacy of Paul Volcker’s tight money and his own tax cuts did not remotely follow the Keynes–Krugman–Summers script. The Reagan era knocked down inflation, turned the dollar into a moonshot and kicked off an era of economic growth so good that even President Clinton hasn’t managed yet to stop it. Fostering a coherent vision of the world, which in practice can make for such prosperity, is a good thing. That is the essence of Mr. Mundell’s work, and the reason he deserves the Nobel.

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7. Conclusion

It is appropriate that the Review of International Economics saw fit to publish this special issue in honor of Robert Mundell. These contributions honor and perpetuate his work.

As my PhD thesis advisor at the University of Chicago, I can say that Bob was most generous in his ideas, not only with me, but also with his other students, such as, John Bilson, Russ Boyer, Gracianna del Castillo, Rudiger Dornbusch, Jacob Frenkel, Lance Girton, Thomas Grennes, Michael Mussa, Douglas Purvis, Donald Roper, Stephen McGee, and Houston Stokes—to name a few. The loyalty of his students speaks well to his character and generosity.

Robert Bartley, Editor of the Wall Street Journal, and close personal friend of Robert Mundell, stood by him and his ideas during lean and fat years. Bartley took great pride in publishing the coherent supply-side ideas that Mundell developed alongside Arthur Laffer and a coterie of supply-side proponents. Robert Mundell also received untiring support from his now grown children, William, Paul, and Robin. Valerie Natsios Mundell believed in and supported Robert over the years, and recently blessed both of them with the birth of Nicholas.

References