

# A Legacy of Model Elegance

*James L. Rowe profiles macroeconomist Jacques Polak*

JACQUES POLAK—a major 20th-century economist whose pioneering research molded the basic economic approach of the IMF—nearly spent his life as an accountant. When he enrolled at the University of Amsterdam in 1932, the 18-year-old planned to join the family accounting firm. But a newly rigorous program in the Netherlands required aspiring CPAs to first get a degree in economics before doing postgraduate work in accountancy. As a result, Polak said in an oral history he gave to the IMF in 2005, his goals “changed with the surroundings.” Like many students in the Depression era, Polak became absorbed by high unemployment and economic malaise. After a year doing parallel work in graduate economics and accountancy, he lost interest in becoming a CPA.

Instead, he embarked on a 70-year career as an economist and international civil servant—a career that continues nearly 30 years after his formal retirement. He joined the League of Nations in its dying days and, almost a decade later, hired on to the newly created IMF, where he helped put in place a cooperative international economic model—hatched at the Bretton Woods conference in 1944, which he attended.

As a senior IMF official for three decades, he played a major role in the development of the international monetary system, including the creation of Special Drawing Rights (SDRs)—the international reserve asset. But Polak and colleagues agree that his most enduring contribution to both economics and the Fund is the economic model that bears his name. The Polak Model explained a country’s balance of payments in monetary terms, enabling economists to understand the causes of a country’s international economic imbalances. And, by pinpointing the source of balance of payments problems in domestic credit creation, the model also gave the IMF the ability to prescribe steps a country should take to correct them.

The IMF that Polak joined in 1947 (and where he maintains an office at the age of 94) oversaw an international monetary system based on fixed exchange rates, with gold and the U.S. dollar at the center. Private capital played a small role, and by the 1960s a major worry was international liquidity—whether there would be enough dollars

around to facilitate the volume of transactions among countries essential to global growth and prosperity. That system transformed into one in which exchange rates are free to fluctuate in response to market forces and gold’s role has essentially ended. Today, private capital flows dominate the international financial system.

As a top IMF staff official from 1958 through 1979, Polak was part of sometimes thorny economic and political decisions that marked the system’s metamorphosis: negotiations over IMF loans to the United Kingdom in 1965 and 1967, creation of the SDR, and the death of the global fixed exchange rate system in the early 1970s. Later, he was Executive Director from 1981 to 1986 for the Netherlands, whose constituency included two socialist economies seeking IMF assistance.

## The Great Depression

Perhaps as befits an economist who found his calling in the Great Depression, Polak’s first major work, his 1937 doctoral thesis, studied the use of public works to counteract an economic downturn. In writing it, he sought the guidance of Jan Tinbergen, who in 1969 would share the first Nobel laureate in economics. Tinbergen had already developed an econometric model of the Dutch economy and would soon develop one for the United States. By 1937, Tinbergen had moved from Amsterdam to Geneva to do econometric studies of business cycles for the League of Nations. He asked Polak to join him as an assistant.

It was an exciting time for Polak, whose work table was at right angles to Tinbergen’s desk. “I had the opportunity to absorb his method of work as if by osmosis,” Polak wrote in the introduction to a collection of his papers. “I learned more mathematics and even, I believe, more economics in that office than during my entire studies. The kind of work done in Geneva was at the very front line of economics and econometrics. . . . Subjects suitable for journal papers were as easy to find as colored eggs on Easter morning.”

In Geneva, Polak produced his first works in English, in early 1939, shortly after Tinbergen had returned to the Netherlands and shortly before World War II. In his first paper, he relied on Tinbergen’s econometric model of the



United States to estimate the marginal propensity to consume for average workers, high-income earners, and farmers and then derived an estimate of the Keynesian multiplier—the concept that explains the ultimate effect on income and output of an increase in spending.

### Planning for war's end

But as the war engulfed Europe, Polak and his colleagues shifted their focus. They were already anticipating the end of the conflict, seeking to learn lessons to apply to the next peace from what Polak called the “botched” Versailles Treaty that had ended World War I and from the bad economic policies many countries pursued during the interwar period.

By summer 1940, half of France had been overrun and German troops were at the Swiss border. “Some important people in the United States,” Polak has recounted, wanted to sustain the League’s work, even though the United States was not a member, and persuaded the U.S. government to relocate the League’s economists to the Institute for Advanced Study at Princeton University.

That meant moving 10 economists and their families from Geneva through occupied France to Franco’s Barcelona by bus, “crossing two borders at a time when all diplomatic relations were on edge,” and then traveling by train to Portugal where they would catch a boat. It was, Polak told F&D, a “harrowing” trip that began with a collision between their bus and

a freight train that left the bus in a low-lying field and the carefully laid plans in shambles.

But the group survived, reached the States, and took up residence at Princeton, where for the next three years Polak prepared reports on such topics as food relief, balance of payments problems of countries that borrowed internationally to rebuild, and exchange rate depreciations in Europe during the 1920s. In April 1943, Polak took a job as an economist at the Dutch embassy in Washington, reporting on the same day that the *New York Times* broke stories about British and U.S. plans for the postwar economic architecture. He became a Dutch representative to the planning sessions that preceded the Bretton Woods conference and a member of the Dutch delegation to the conference itself in July 1944. He has said that the nations that established the so-called Bretton Woods institutions—the IMF and the World Bank—were unanimous in believing that “it would be extremely important” that this postwar period “be handled very much better” than that following World War I. “And, in fact, it was.”

### Joining an infant IMF

Shortly after Bretton Woods, Polak joined the new United Nations Relief and Rehabilitation Administration, created the year before to help European and Asian countries deal with the ravages of war and refugee issues. But after the United States stopped backing the agency in 1946, Polak said he was “pretty badly in need of a job.”

The first Director of Research at the still-organizing IMF was Edward M. Bernstein, who as a U.S. Treasury official had been a key player at Bretton Woods. He offered Polak a job as director of the statistics division in the Research Department, with the understanding that if Camille Gutt, the first IMF Managing Director, signed off on the hiring, economic research would be concentrated in that division. Gutt, a former Belgian finance minister, knew Polak from his days at the embassy when Belgium and the Netherlands collaborated on devising exchange rates between the dollar and the Belgian franc and Dutch guilder that the Allies would use after taking the two countries from German control. Gutt approved the hiring offer, but with a curious proviso. He had just sent several division chief appointments to the Executive Board for approval and felt he could not submit Polak’s for a while. Gutt told Polak that if he were willing to take the risk of being hired retroactively, he could start January 1, 1947. “Since I didn’t have any other good option, I took it,” Polak has said.

He used the time to work further on a path-breaking model of the world economy that he developed in 1939. It was a simple construct that included only eight countries—the United States, the United Kingdom, France, Belgium, Czechoslovakia, Norway, the Netherlands, and Sweden. But it was the first time anyone had built such a model. He expanded the model to incorporate 25 countries and several more behavioral equations, eventually publishing it as a book in 1954. Among its conclusions: Well more than half of the decline in world trade



Jacques Polak (standing, second from left), in a Research Department meeting in the IMF's early years.

during the Depression was the result of reduced demand in the United States. The model and its techniques were the basis of early econometric modeling of the world economy by IMF staff and, in that sense, a predecessor of the far more sophisticated models the IMF uses today.

“The trade model was pioneering work, but that is its claim to fame,” says John Williamson of the Peterson Institute for International Economics and an IMF colleague of Polak’s in the late 1970s. “There were no predecessors,” he adds, but there have been many successors, “and they quickly became more sophisticated.” However, Williamson notes, the story is different for Polak’s extraordinarily simple yet powerful theory of the relationship between the money supply and a country’s balance of payments. That model, published in 1957, has stood the test of time.

### The Polak Model

Not only did Polak develop a new understanding of the sources of a country’s international financial imbalances, his model also indicated policy measures that the IMF could recommend to countries to correct their imbalances. “There must be literally hundreds of papers that take off from the Polak Model and hundreds of Fund programs that utilized it,” says Mohsin Khan, Director of the IMF’s Middle East and Central Asia Department. Its genius is that it “straddled both theory and operational work,” adds Khan, who wrote his doctoral dissertation on the monetary approach to the balance of payments at the London School of Economics under Professor Harry G. Johnson, who had developed a similar theory.

Milton Friedman, the late Nobel laureate, posited that the power of a theory is in both its predictive ability and its simplicity—that it does as good a job as competing models, or better, while requiring significantly less information. The basic Polak Model is elegant in its simplicity—and in its data requirements. It employs but four equations. In a 1997 article marking the model’s 40th birthday, Polak said that its simplicity was driven largely by reality:

- Data and econometric models were scarce in the early postwar years.

- Only a model limited to a few crucial variables would be likely to have “broad, general applicability.”

- The policy focus had to be on a variable that authorities could control to influence the balance of payments—in this case, domestic credit creation.

Polak started with the proposition that in an economy that is open to the outside world and whose exchange rate is pegged, the money supply is *not* a policy instrument that authorities can wield independently—as most then believed—because it will reflect the country’s balance of payments, the sum of its financial relationships with the rest of the world.

As Khan explains: “His model derives a formal relationship between changes in the domestic component of the money stock

(domestic credit) and changes in international reserves, which can then be employed for setting policy. Specifically, and from an operational standpoint, the Polak Model allows one to obtain a value for domestic credit that is consistent with a desired balance of payments position. This is precisely the framework used for Fund programs. We pick a target for the balance of payments (or international reserves) and derive the consistent level of domestic credit, which gives us the ‘credit ceilings’ common in Fund programs.”

The Polak Model and the world trade model played a major role in driving the IMF in its early years. Later, as Polak shouldered more responsibilities—succeeding Bernstein as Director of Research in 1958 and being named Economic Counsellor in 1966—other needs of the institution often drove his agenda. “Research in the IMF had to address IMF operational problems,” he explained, such as the role of gold, the level of reserves a country should consider adequate, exchange rate equilibrium, or a reasonable formula for a country’s access to the Compensatory Financing Facility set up in 1963 to help member countries hurt by a temporary decline in exports. “Much of my daily time was devoted to putting out a variety of brush fires and learning much about the international monetary system and the Fund in doing so.”

Among the subjects of the scores of papers he produced during and after his years at the IMF were the impact of the 1949 devaluations of the major European currencies (1951); the generally inadequate level of international reserves following World War II (1952); the choice of an exchange rate regime for developing countries (1988); and issues surrounding transition economies and exchanges rates (1991). Through much of the 1960s and 1970s, he guided Fund research on international liquidity issues, including the creation of the SDR. Two compendiums of his works have been produced (Polak, 1994; Polak, 2004). Moreover, Polak has served as a “professional mentor, not just a boss, to generations of research economists at the Fund. More than anyone else, Jacques Polak made the IMF into an institution where serious economic research was applied to practical policy problems,” according to IMF historian James M. Boughton.

In recognition of Polak's contributions, the IMF named its annual research conference for him.

Yet it wasn't always heavy going. Polak managed some time for whimsy, finding an amusing side to practicing what has been dubbed "the dismal science." He put economic tools to work on the popular board game Scrabble to devise a rules-based approach to maximizing one's total score (see box).

### Not your average retirement

It was Polak's final assignment before retiring from the IMF staff that held so much promise for stabilizing the international monetary system. A growing global shortage of U.S. dollars in the 1960s led in 1969 to the creation of the SDR, a reserve asset countries could use to settle among themselves that didn't depend on the payments imbalances of key countries. The supply of dollar reserves, for example, depended on a U.S. payments deficit that undermined the value of the dollar. The IMF could create SDRs in much the same way a domestic central bank like the U.S. Federal Reserve creates dollars. But hardly had the first SDR been issued than the global liquidity shortage evaporated—in large part because of U.S. imbalances.

By the late 1970s, the liquidity shortage may have ended but the SDR could still play a useful role, in Polak's view. The U.S. economy was performing poorly, the dollar was floundering, and the international financial system was edging toward instability. The situation in September 1978 "struck me as ideal" for newly arriving Managing Director Jacques de

### The economics of Scrabble

During a lengthy recuperation from surgery in 1955, Jacques Polak whiled away the hours playing the popular board game Scrabble. It wasn't long before he subjected the word-building game to economic analysis—invoking such common concepts as the Keynesian multiplier and Marshallian profit maximization to divine a formula to maximize a player's total score.

The fundamental mistake inexperienced players make is trying to maximize their score in each turn, a strategy that, in the argot of economics, involves a cost: the "sacrifice of the score that might have been obtained with the same letter in another word," Polak opined in a 1955 article in the *American Economic Review*.

Polak developed a profit-maximizing formula of how best to make words using the 100 letter tiles in each game that have values running from 1 for common letters such as E to 10 for hard-to-use letters Q and Z. He propounds three rules:

- Letters with face values of 1 and 2 should, and those with a face value of 3 may, be used any time.
- Letters with face values of 4 and 5 should be used only if they score at least double, but a player should not hold onto them for a triple score.
- Letters with face values of 8 and 10 should almost always be kept for triple scores.

The derivation of the rules may be complicated, but they "can easily be followed in practice, even by beginners," he concluded. And apply them he did, Polak noted long after the article was published. Sadly, he was regularly bested by his wife, who cares nothing about the economics of Scrabble.

Larosière "to make a radical proposal, to which de Larosière responded most positively," Polak recounted. The proposal was to create a special "substitution" account into which countries could deposit unstable dollars they no longer wanted and receive SDRs in return. The account would have cemented the SDR as a major asset and, in the view of supporters such as Polak, contributed to international financial stability.

De Larosière "found an interested Undersecretary of the [U.S.] Treasury in Anthony Solomon and . . . it was all handled hush-hush among us plus [Deputy Managing Director William] Dale on the IMF side" through 1979. The IMF Board went along with the idea, and it appeared ready to be approved in April 1980 at the meeting of the policymaking Interim Committee in Hamburg. Polak stayed on several months past his formal retirement at the end of 1979 to help de Larosière shepherd the account. But support for the proposal suddenly vanished, in part because the dollar strengthened. Countries, averse to change, went along with the idea of the account because they saw no other solution, not because they liked it, Polak said. When the dollar strengthened, "they saw hope of getting along with the existing system," and "an opportunity for radical change in the system was missed."

After Polak left the Fund's employ, retirement was fleeting. In 1981, he took up the Dutch government on an offer he had rejected four years earlier: to become Executive Director for the Netherlands, which also included Yugoslavia, Romania, Cyprus, and Israel. Of the five, Yugoslavia was the most time consuming and frustrating—a harbinger of some of the difficulties eastern European economies would face after the breakup of the Soviet bloc. Beyond these questions, he told F&D, he found as a member of the Board that an executive director from a small country can "play an important role as part of the conscience of the Board."

In recent years—which included a stint as president of the IMF's Per Jacobsson Foundation from 1987 to 1997—Polak has championed restructuring "the IMF into a more conventional and understandable financial institution." According to Boughton, Polak did "pioneering work on how to restructure the IMF's balance sheet. His goal was to eliminate the role of national currency holdings altogether and re-create the IMF as a financial institution based solely on the SDR. That idea was not (or has not yet been) accepted, but it did lead to a restructuring of the balance sheet in a way that is much more transparent and much more like a conventional bank." ■

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