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How I Learned to Stabilize Rice Prices and Why: A Retrospective Essay

C. Peter Timmer

Thomas D. Cabot Professor of Development Studies
Emeritus, Harvard University
Cambridge, MA, USA

My older grandson visited over the Thanksgiving break in late November 2023, and he asked me a tough question: “How did you learn to do what you do?” He is a freshman at Brown University, majoring in engineering and design. He has realized that career paths have an element of planning—what major to sign up for; what courses to take—but also a large degree of serendipity. He knows *what* I have done over a 60-year professional career, but it is not obvious to him (or to me) how and why my career trajectory took the path that it did. How did a farm boy from Southwestern Ohio learn how to stabilize rice prices in Asian countries and even in the world market?

A BRIEF OVERVIEW

Answering that question is timely. Whether the world has the resources, and the will to feed itself, is back on the agenda. I have participated in this agenda for most of my professional career.¹ As background, I grew up on a farm in Miami County, Ohio (just north of Dayton), worked in a small family-run tomato canning factory for many years (Timmer 1963), and then left to become an economist. I obtained a PhD from Harvard, specializing

1 This paper for the 20th anniversary special issue of the *Asian Journal of Agriculture and Development* traces the evolution of my thinking on what to do about food price instability. Now that feeding the world is again front-page news, I am trying to figure out what pieces of my own thinking over the past half century might provide guidance on how to proceed. The world food system is under great stress as I write (early 2024), but this is probably a good time for some historical perspective as well as active engagement from people with knowledge of on-the-ground realities. I apologize in advance for the extensive listing of my own publications, but their story is my story.

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in economic history (Timmer 1969), but did my thesis on a more esoteric topic (Timmer 1971).

Through good luck, a sensitivity to agricultural issues, and a longstanding interest in the role of food prices in producer and consumer decision making, I ended up as a development economist specializing in agricultural, food, and nutrition issues, mostly in Southeast and East Asia. Apart from the academic part of my career spent at Stanford, Cornell, Harvard, and the University of California, San Diego, I was deeply engaged with national policymakers in Indonesia, China, and Vietnam (Afiff and Timmer 1971; Timmer 1975a; 1993a; 1996a; 2004). Without exception, a major policy goal in all three countries was improving the state of food security for their populations.

I have three main specialties as a professional economist, although none are at the core of the profession. My first area of expertise grew out of my early experience in Asia analyzing the role of rice in domestic economies at different stages of development: the *structural transformation* (Timmer 1975b; 1984; 1988a; 2009a; 2015b; 2019; Timmer and Akku 2008). During this process, agriculture as a sector plays a progressively smaller role in the macro economy, at the same time that it becomes more productive at the farm level. The need for stable rice prices changes radically during the structural transformation, at least in welfare terms (Timmer 2019). Politics is a different story (Timmer 1987; 2013; 2015b; 2022b).

My second area of expertise is in the nature of “*pro-poor*” economic growth and the role of the agriculture sector in promoting inclusion. That journey started with my work in Indonesia in the 1970s,² but reached a broader audience with *Food*

Policy Analysis (Timmer, Falcon, and Pearson 1983). That volume extended the traditional focus of agricultural development practitioners from farm productivity to include food consumption and nutrition, marketing and international trade, and the macro environment facing the rural economy. A stream of work on “pro-poor growth” (the preferred term now is “inclusive” growth) emerged from that early focus and continues today (Timmer 1991b; 1993b; 1995a; 2004; 2005; 2007a; 2007b; 2008b; 2016; 2023c). The role of agriculture in this process has been repeatedly challenged, partly because historical lessons are not very satisfactory to policy analysts who demand significant results from randomized controlled trials (RCTs in the jargon) as a guide to policymaking (Dercon and Gollin 2014).

To do this kind of work, it is necessary to understand the “food systems” in which each society operates. This understanding can involve some esoteric econometrics (Timmer 1981), but at a broader level, most consumers have a gut instinct about the food system in which they operate (pardon the pun). In his review of a book by Dan Saladino in the *New York Times Book Review*, Pete Wells, the *New York Times* restaurant critic, provided a very unflattering, but quite recognizable, definition of “the food system.” What we really mean is profit-minded corporate logic set free on a global scale at an incalculable cost to health, economic stability, cultural coherence, and joy (Wells 2022).

This definition no doubt resonates with many readers. However, the definition misses the essential trade-offs in those efforts, trade-offs that reflect the overwhelming complexity of food systems globally and locally, how those two locales are connected, and yet have quite different objectives. This complexity stems from the fact that all functioning food systems are embedded in day-to-day market transactions. The need for each of these transactions to be *mutually* beneficial to buyer and seller means that welfare

2 After completing my PhD thesis for the Harvard Economics Department and teaching two quarters at the Food Research Institute at Stanford, I took leave to join the Harvard Advisory Group to the Indonesian National Planning Agency (Bappenas) in May 1970. There, I reported directly to Saleh Afiff, the Head of the Agricultural Planning Bureau at Bappenas, and was encouraged to work as well with Col. Bustanil Arifin, the Deputy for Operations and Logistics at the Food Logistics Agency (Bulog). Both were fluent in English, having studied in the US. The Minister of Finance, Ali Wardhana, also asked to receive my research papers and policy memos, and I was a regular visitor to his

office whenever I was in town. Both Afiff and Arifin served as “supervisors” and mentors for decades, even after they have left public office.

of food consumers must be enhanced while food producers and traders must make a profit (Timmer 2015a). When the *policy goals of food security and stable food prices are imposed on these private market transactions*, the complexities are obvious.

The third area of expertise is *stabilizing rice prices*, both in individual countries and in global markets (Timmer 1988b; 1988c; 2012; 2014a; 2022c). There is substantial practical value in this expertise, as Asian countries often equate food security with stable rice prices (Timmer 1995b; 1996b; 2014b; Dawe and Timmer 2012). The country experience in stabilizing rice prices was also helpful during the rice price crisis in 2007/08, when it was possible to “prick the bubble” of speculative rice prices on world markets (Dawe 2010; Slayton 2010; Slayton and Timmer 2008; Timmer 2010a).

The lessons learned during the 2007/08 experience in bringing the world rice market out of its speculative frenzy also proved useful in coping with the world food crisis caused by Russia’s invasion of Ukraine (Timmer 2022a; 2022b; 2022c; 2023a; East Asia Forum 2023). The strong El Niño in late 2023 added impetus to food shortages, because of its significant impact on Asian rice supplies. The paper closes with lessons from this most recent experience.

A PERSONAL JOURNEY

Understand the Role of Agriculture in Economic Development

Although I had done my best to study agriculture as an undergraduate at Harvard (Class of 1963), I ended up with a combination of economics, biology, and chemistry that provided useful analytical background, but few institutional insights. Before going back to graduate school, I spent a year studying food science in Glasgow, Scotland on a Fulbright Fellowship, and then two years as a commodity analyst with W. R. Grace and Co. in New York. My boss in the Business Economics Department, where I was a junior commodity analyst assigned to write the monthly

commodity report as well as background reports on various commodity markets of interest to W. R. Grace (or to J. Peter Grace, the President who often speculated personally in these markets), offered some sage advice soon after I arrived. “When your barber offers you a ‘hot investment tip,’ it’s time to get out.” I had already seen “speculative frenzy” in action during occasional lunch breaks watching the trading pits on the New York Coffee, Sugar and Cocoa Exchange, next door to the W. R. Grace offices on Wall Street. That experience has resonated.

In graduate school, Wally Falcon, an assistant professor in the Economics Department and research director for the newly formed Harvard Development Advisory Service, taught a seminar on agricultural development. I sat in the seminar both years I was at Harvard.³ Equally important, I took Alexander Gerschenkron’s required first-year course on economic history. Gerschenkron’s best known work was “Economic Backwardness in Historical Perspective,” with its arguments that backwardness offered advantages that countries

3 One session, probably in the fall semester of 1967, was especially memorable and perhaps formative. The guest speaker was Martin Abel, on leave from the University of Minnesota to serve as undersecretary of agriculture in the Lyndon Johnson administration. President Johnson was frustrated by India’s refusal to support the US in the Vietnam War, and despite the back-to-back failures of the monsoon rains and significant shortfalls in wheat production, Johnson put India on a “short tether” to restrict US food aid shipments. Martin Abel defended this policy, commenting that “it’s a long way from Kansas to New Delhi.” I piped up from the back row “especially when you have to ship the wheat through Washington, DC.” The class broke up in laughter, Martin Abel took a long time to forgive me for the irreverent comment at his expense, but the political nature of food security stuck with me as a powerful lesson. The response from India was equally revealing. The government asked M.S. Swaminathan, the country’s leading agricultural scientist, to invite Norman Borlaug to conduct local field trials of the short-statured, fertilizer-responsive wheat varieties he had developed at the Rockefeller-sponsored research station in Mexico (now the International Maize and Wheat Improvement Center or CIMMYT). The Green Revolution was set in motion. After several decades of rural investments and policy reforms, India became the world’s largest rice exporter and a regionally significant exporter of wheat.

could use to catch up (Gerschenkron 1962). It is impossible to study economic history without significant exposure to the role of agriculture in the economy.

Evaluating the “role” of agriculture depends, to a large extent, on what agricultural commodities are worth—what are the “right prices?” (Timmer 1986). How can they be so volatile from year to year, if economic development is fundamentally a very long-run process? A focus on *food price volatility* is easy to understand from this perspective. I once described my career as “stabilizing rice prices.” Development does not seem possible without a sense of food security among the population; and in Asia, that means stable rice prices in the major urban markets (Timmer 1989).

The role of agriculture in the general development process, and in the “catching up” process in particular, can be summarized in three broad lessons: (1) the heated contentiousness of the debate, reflecting sharply different ideological approaches to development strategies (witnessed early on in the debates between Ricardo and Malthus over the impact of the British Corn Laws); (2) the critical importance to the poor of how the debates are resolved in actual development policies; and (3) the limited relevance of most micro-based economic research into resolving the debates, designing effective “pro-poor” growth policies, and guiding their implementation.

The role of agriculture is highly contentious: even asking the question implies that market forces may not be producing the “right” outcomes for broader development purposes and thus government interventions will be needed (Timmer 1995a). The tension between market forces and government interventions remains a fundamental divide in economics and policy worlds. T.W. Schultz reflected the beliefs of many of his colleagues when he argued that economists should not become “yes-men” in the halls of political economy (Schultz 1978). But the “rational actor” model that underlies Chicago economics fails to appreciate the importance of market failures in the food sector. Consequently, free-market economists do not understand the political economy of food security because they

do not appreciate the deep behavioral foundations that underpin a broad desire for stable food prices. An argument for free trade in the face of such political demands is usually ignored in agricultural development and food security debates (Timmer 2009b; 2010b).

A second lesson is that the topic is incredibly important to the welfare of billions of individuals. Speeding up the reduction in poverty through rapid growth in agricultural productivity has been one of the great success stories since the 1950s in East and Southeast Asia. However, that pathway out of poverty in South Asia and Sub-Saharan Africa has not materialized to nearly the same extent. Only macro—and sectoral—based historical analysis can explain why.

The third lesson—the limited relevance of modern micro-based economic analysis in helping to understand these issues—is also of long standing. Over half a century has passed since the general complaint in the early 1970s that the economics profession was “busy designing the optimal location of deckchairs on the Titanic.” But the divergence has widened between modern empirical methodologies, with their insistence on identification strategies (hence the fondness for RCTs), and the messy real-world problems that policymakers must deal with on a regular basis. It is perverse pride, I suppose, that leads me to quote Dercon and Gollin’s assertion in a prominent economics journal:

We simply argue that there is little evidence that would support (or oppose) the claim that public investments in agriculture will generate greater improvements in social welfare than investments in other sectors (Dercon and Gollin 2014, 6).

They then cite my 1988 paper on “The Agricultural Transformation” as the leading example of pro-agriculture analysts letting their enthusiasm get ahead of data and methodology (Timmer 1988a).

The Johnston-Mellor model provided a strong narrative and conceptual argument for agriculture’s role in growth. The empirical roots of the paper were a (specific and highly

contested) reading of historical experience, including from Europe and Japan, suggesting that growth success in these countries was closely linked to growth in agricultural productivity. Over the years, subsequent invocations of this theory became less nuanced, veering toward a more dramatic (and much less defensible) claim that all successful countries pass through a phase of fast agricultural growth as the engine for their growth process (e.g., Timmer 1988a). This argument resonates still in policy narratives; for example, the influential *World Development Report 2008* (World Bank 2007) highlighted the essential role of agriculture in early stages of development and made the case for a much stronger public policy focus on this sector from a growth perspective, not least in poor countries such as in sub-Saharan Africa (Dercon and Gollin 2014, 8).⁴

What would “evidence” look like to support public investments in agriculture? Nothing in the historical literature convinces Dercon and Gollin that the case has been made. Indeed, they seem to argue that the world is so complex that such a case can never be made to the satisfaction of serious economic analysts who might seek to offer advice on development strategies to policymakers. To be fair, they were concerned with Sub-Saharan Africa, where heterogeneity is overwhelming, and the historical record is short and unclear. But in dismissing the historical record of successful countries, Dercon and Gollin have basically thrown out the only effective methodology that analysts have if they are to offer workable insights to policymakers. Such modesty is misplaced and even dangerous.

4 I served on an advisory team to the main authors drafting the *WDR 2008* (World Bank 2007) and argued successfully that agricultural transformations that drove rapid structural transformations provided the best analytical framework for the WDR. It was this framework that Dercon and Gollin were highlighting, and its emphasis on the *necessity* to raise agricultural productivity.

Instead, we need to learn from history and experience. This need creates a scholarly tension—how to balance the power and depth of a well-documented example, a case study, against the need for a broader theoretical framework that is testable using large datasets and modern econometric techniques. The evolution of thinking about the “how” and “why” of stabilizing rice prices is a prime example of this tension.

The How and Why of Stabilizing Rice Prices

Over several decades of working with planning agencies and food logistics agencies in a number of large Asian countries, I learned the “mechanics” of how to stabilize rice prices. For a number of decades, I was deeply engaged in helping the Indonesian Food Logistics Agency (Bulog) implement its mandate to defend policy-set floor and ceiling prices for rice. Much analytical work and model-building went into this effort, over many years.⁵

5 In mid-1999, after the fall of the Suharto regime and the purge of senior government officials by the new government headed by former Vice President Habibie, I received a plaintive call from a mid-level Bulog official that I had worked closely with for years. “Professor Timmer, can you please come back to Indonesia to help us? You are the only person who understands how Bulog works.” I had left Harvard and started as dean of the Graduate School of Asian and Pacific Studies at the University of California, San Diego (IRPS/UCSD) the autumn of 1998 and was recovering from emergency surgeries to fix two detached retinas (six months apart). But I went as soon as I was cleared to fly, in late 1999. My continuing involvement in Indonesia proved unworkable for the university, and I resigned as dean in the spring of 2000. I continued as a professor until the summer of 2003, and then retired from academia. I had invited Professor Dr. Saleh Afiff, my former colleague who eventually became the coordinating minister for economic affairs in the last Suharto cabinet, to be a visiting professor. We co-taught a year-long course on the history of food policy in Indonesia during academic year 1999/2000. There was vigorous back-and-forth discussion between the two of us, to the delight of the students. On one occasion I explained my research on the rationale for stabilizing rice prices. Afiff commented “that’s not how I explained it to parliament...”

The most important lessons were these:

- (1) Be realistic about the farm price and consumer price you are asking the food agency to defend, and be sure there is a reasonable margin between the two so that the private sector can carry out most of the logistical tasks.
- (2) Have a logistical and financial capacity for the food agency to buy surpluses in rural areas during the harvest if the price falls to the “policy floor,” and be sure there is ample warehouse space to store this surplus, with trained grain handlers to minimize losses during storage.
- (3) Be sure there are adequate publicly owned and managed buffer stocks in those warehouses as the “short season” approaches when rice prices usually reach their peak. Managing public grain reserves turns out to be the critical factor in stabilizing rice prices (Timmer and Dawe 2007).
- (4) Invest in the analytical capacity to have a reasonably good idea of how large those stocks need to be under “bad” circumstances, even if everyone hopes for “good” circumstances. The public food agency must accept the risks that accompany these uncertainties (and must receive public finances to remain solvent when the risks turn out badly).

It is easy to see why most public efforts to stabilize rice prices in particular, and food prices more broadly, fall on hard times. A successful stabilization program is costly in financial, management, and analytical terms. But it also pays very high economic and political dividends. All of the “miracle economies” of Asia succeeded to a substantial extent.

These historical lessons leave the more difficult question: *why* stabilize rice prices? It is simply not a question asked in most Asian countries. But trade economists uniformly think it is a bad idea. International financial institutions routinely advise countries not to do it and refuse to provide assistance to help. Outside of the successful economies in Asia, there are no examples in the developing world. It is easy to see why the prospect

of setting up a food price stabilization program is daunting, and the institutional objections are fierce.

But how else is a society to provide what stable food prices have provided historically to farmers and consumers alike: a sense of food security that allows investment decisions to be made with long time horizons, in both private and public affairs. A sense of food security allows deep investments in human capital, even in poor families. It allows markets to be efficient allocators of scarce resources, instead of being scapegoats when sudden food shortages emerge, people riot in the streets, and governments fall.

Seven Milestones in Figuring Out “Why?”⁶

It took me many decades to figure this out. Because the question never came up during my advisory work in Asia, I only had to answer the question when teaching dubious students, both undergraduates and graduate students, participating in academic workshops and conferences, and publishing articles on my experience with rice marketing and price stabilization. Reflecting on that long experience, I see a number of articles that progressively answered the question. I have picked out seven, in particular, that count as “milestones” in my thinking and professional writings.

1. The basic starting point for this line of analysis was published in 1989 in *Food Policy*: “Food Price Policy: The Rationale for Government Intervention.” A more detailed and extended

⁶ I realize that the articles discussed in this section were published in specialized, often obscure, journals or edited books. I learned from early experience that mainstream economics journals were not interested in these topics. David Dawe and I had a breakthrough in 2007 when the *Asian Economic Journal*, published in Japan, accepted our manuscript on “Managing Food Price Instability in Asia: A Macro Food Security Perspective,” and published it as the lead article in the issue (Timmer and Dawe 2007). Note that much of the text in each entry is taken directly from the articles themselves, with some minor editing to make the message clear to current readers.

version of the argument appeared in an HIID⁷-sponsored research volume (Timmer 1991a). The goal of the paper is explained as follows:

Neither the underlying analytical foundations nor workable operational procedures have been satisfactorily developed for domestic price-stabilization schemes to be designed, implemented, and evaluated with any degree of coherence. The fact that nearly all countries in Asia attempt to implement such schemes suggests that the rewards to progress on both fronts—analytical and operational—will be very substantial. This paper lays out the basic logic of the analytical approaches in order to focus the discussion of operational issues on pricing strategies that are consistent with the theoretical rationale for their design and implementation (19).

This paper appeared after both *Food Policy Analysis* (Timmer, Falcon, and Pearson 1983) and *Getting Prices Right: The Scope and Limits of Agricultural Price Policy* (Timmer 1986), and it was stimulated by omissions in both volumes on what “appropriate” agricultural price policy really meant, and why. The paper was met with almost total neglect by the profession until the world food crisis in 2007/08, at which time citations picked up noticeably. The average per year from 1989 to 2006 was four; the average from 2007 to 2023 was almost 12. Citations are, of course, an imperfect measure of professional interest and impact, especially when they are from Google Scholar, which these are. But at least the direction of change is clear.

Upon re-reading this article I am a bit surprised at how carefully argued it is and comprehensive. But it was almost completely ignored outside the small and select group of scholars and policy analysts who worked on “food policy” rather than “agricultural economics.” Things are changing, especially after Chris Barrett became the editor of *Food Policy*. As the agricultural economics profession’s leading scholar, this was a powerful signal.

2. The second milestone, and something of a turning point as well, was the publication in 1996 of “Does Bulog Stabilize Rice Prices? Should it Try?” in the *Bulletin of Indonesian Economic Studies (BIES)* (Timmer 1996b). The manuscript had a tortuous review process, with three different reviewers each offering scathing rebuttals to my theoretical arguments and empirical evidence that Bulog did indeed stabilize rice prices, with the institutional costs the agency incurred well below the contribution to economic growth engendered by stable rice prices in the 1970s and 1980s. Keeping with its macro perspective, the paper then argued that in the 1990s and presumably after, as the importance of rice to the economy declined, Bulog could widen the band between the floor price and ceiling price, and gradually cut back its operations except in remote areas where the private sector had a thin presence.

Although this article is now the fifth most cited in the entire history of BIES, according to its website, it too was largely ignored early on. Between 1996 and 2006, the article received four citations per year on average. From 2007 to 2023 it received 11.2 citations per year, although clearly interest in the article has declined as Bulog’s influence over the Indonesian food economy has also declined.

The Bulog article explained in some depth why neo-classical economists, especially micro theorists and trade economists, “don’t get it,” i.e., the rationale for stabilizing rice prices in Asia. The benefits are mostly at the macro level, where stabilization helps extend investment horizons, dampens returns from speculation and hoarding, fosters human capital investments in poor rural households, and leads to faster economic growth. Putting the food price stabilization argument in macro terms changes the entire nature of the debate.⁸

8 Even the Newbery and Stiglitz (1981) volume that destroyed the rationale for commodity stabilization schemes in global markets suggests that there might be important macroeconomic benefits if the commodity was “important” to the economy. David Dawe subsequently demonstrated the importance of these macro effects in his Harvard PhD thesis and

3. “Macro Dimensions of Food Security: Economic Growth, Equitable Distribution, and Food Price Stability” appeared in 2000 in *Food Policy*, although an earlier version appeared in an edited conference volume (Timmer 2000). This article made the macro story explicit, and for the first time demonstrated how growth, distribution, and price stability interacted to generate sustainable food security.⁹

The analysis was straightforward. It used a simplified Engel function for rice, in semilogarithmic form, and then explored how rice consumption changed due to price shocks and different types of income growth. In the various policy scenarios examined, the combination of stabilizing rice prices with rapid, pro-poor growth eliminated the probability of famine almost immediately and reduced poverty levels to near zero in one generation.

As with the previous works, the article was little noticed until the world food crisis in 2007/08, which alerted the profession to the importance of addressing food security as a policy issue, not just a market issue. From the time it was published in 2000 until 2007, the article averaged just over four citations per year. In the decade starting in 2008, it averaged 14.7 citations per year. In the next six years, to 2023, it averaged 18.1 citations per year. Perhaps the “macro story” is beginning to resonate with the academic profession.

subsequent summary article in *World Development* (Dawe 1993; 1996).

9 To illustrate how dubious most economists were to efforts to stabilize rice prices, the article quoted extensively from an article by Kym Anderson and Jim Roumasset that dismissed the approach in favor of using private markets (Anderson and Roumasset 1996). Some years later, in a private conversation in the Asian Development Bank dining room during a conference we both were attending, Roumasset patiently explained to me why even risk-averse farmers would not benefit from a rice price stabilization program: any farm-level benefits were too small to justify the large budget costs and efficiency losses. I agreed, but said my point was the benefits from rice price stabilization in Asia were mostly macro in nature, especially via the rate of economic growth. “Oh,” Jim said, a bit taken aback, “you’re talking about macro effects. You are probably right about that.”

4. “Reflections on Food Crises Past” appeared in 2009 in *Food Policy* (Timmer 2009b). The article had originally been commissioned by the World Bank to help their agricultural team understand what happened during the 2007/08 world rice crisis. The team wanted to know whether lessons from the world food crisis in 1972/74 had been ignored, especially by the World Bank, and whether I had any criticisms of the “best practices” the bank used to provide guidance to in-country teams and member countries when dealing with unstable food markets. I did. Although there was some grumbling that I was being unfair to the bank, I was encouraged to seek an outside publisher to encourage further discussion of the issues.

Coulin Poulton, the editor of *Food Policy*, quickly offered to publish the manuscript as a “viewpoint,” which speeded up the review process. It was published as the lead article in the next issue and has clearly been one of my most influential publications, judging from the almost immediate citations to it, and the continuing citations in the years since. In the first seven years after publication, the article received nearly 35 citations per year. In the next seven years, to 2023, it recorded almost 17 citations per year. It remains to be seen if the lessons discussed in the article, a “capstone” in my thinking in many ways, will continue to resonate with the profession.

It is a complicated story. This paper analyzes the 1972/74 and 2007/08 food crises in some depth, focusing especially on how the world rice market behaved during each crisis. Detailed case studies of India, Indonesia, and Thailand were developed. At least two lessons should have been learned from the decade-long response to the world food crisis in 1972/73. First, food price volatility is a very serious problem, and governments of poor countries, which attempt to stabilize food prices, could benefit from analytical and financial support. This point was made explicitly because it contrasts with the actual hostility countries met from the donors when they tried to stabilize domestic food prices.

Second, current food prices are a poor guide to long-run opportunity costs, precisely because they

are so unstable. Investments to raise agricultural productivity, by their very nature, have long-run payoffs. Although private investors might have short horizons and be highly averse to risk, governments and donors should be able to take the long view on the role of agriculture in economic growth and poverty reduction, and invest accordingly. In a clear case of market failures, commodity prices often do not send signals with adequate incentives to decision makers (Timmer 1995a).

Rather remarkably, the lesson the donor community took from the 1972/74 experience turned out to be that the market would solve all problems. Corruption in state trading companies and widespread failures to manage grain procurement and storage efficiently, especially in Africa and the Indian subcontinent, led analysts to conclude that governments should not handle the physical logistics required to stabilize food prices. The donors argued that coping with price volatility was not primarily the responsibility of governments, but of producers, traders, and processors, who could use modern financial derivatives to hedge their price risks. Consumers were on their own, and the poor might need “safety nets” to cope with high food prices.¹⁰

A powerful ideology developed in the donor community, especially USAID¹¹ and the World Bank, is that governments were part of the problem rather than part of the solution. This ideology was fueled by two separate, but reinforcing, forces: the collapse of centrally planned economies in the former Soviet Union; and the Reagan–Thatcher

revolution that progressively deregulated the US and UK economies. Despite efforts to keep agricultural development on the agendas of donors and poor countries, the continued dominance of a free-market ideology and low commodity prices in world markets led to a sharp decline in financial investments and policy attention to the sector. In 1985, donors allocated about 13 percent of their project budgets to agriculture; this share had fallen to four percent in 2006.

The neglect of agriculture came with a cost. Productivity growth slowed and the low prices for food commodities stimulated a search for alternative uses, especially as biofuels. As stock levels declined, and consumption of food grains outstripped production for most years in the early 2000s, the stage was set for another explosion in food prices.

Fast forward to June 2007. Grain prices had been gradually rising in real terms for five years. There was a small decline, 0.7 percent, in food grain production from the 2007 harvest, but this decline was entirely due to a 3.9 percent decline in wheat production. Both rice and coarse grain production actually increased in 2007. There was no need for sharply lower food grain consumption, as in 1972/74. With supplies for near-term delivery tight, wheat prices started rising sharply in May 2007. They were followed by corn prices later in the year, as demand for ethanol production in the US put pressure on available supplies. Stocks of both wheat and coarse grains fell sharply during 2007. There was a clear case for higher wheat prices because of the 2007 production shortfall and for higher corn prices because of mandated demand for biofuel production (Naylor and Falcon 2008). The actual price panic that resulted, however, had little rationale in the fundamentals of supply and demand. Speculative fervor spread from the crude oil and metals markets to agricultural commodity markets (Timmer 2008a; Piesse and Thirtle 2009). Prices spiked, first for wheat, then for corn. And then they collapsed when the speculative bubble burst. Prices peaked for wheat in February 2008, in June for corn, and in July for crude oil. There is a clear case to be made that the sudden spike in wheat and corn prices was heavily influenced

10 In an effort to get uniform policy guidance to World Bank staff as well as donor recipients, the bank formulated a series of “best practices” in the various dimensions of food and agricultural policy. My article severely criticized most of these as being impossible to implement in recipient countries, not just because they were politically impossible but mostly because they failed to solve the problems at hand. If a basic market failure is the problem, “increase market orientation” is not a useful approach. The recommendation that Pakistan use sophisticated and complicated financial derivatives to manage price risks, including “over the counter” commodity swaps, in its wheat market, bordered on parody.

11 United States Agency for International Development

by financial speculation. But why the spike in rice prices?

As concerns grew in 2007 that world food supplies were limited and that prices for wheat, corn, and vegetable oils were rising, several Asian countries reconsidered the wisdom of maintaining low domestic stocks for rice. The Philippines, in particular, tried to build up stocks to protect against shortages going forward. Rice prices had been increasing steadily, but gradually, since 2002, but they began to accelerate in October 2007. Quickly, there was concern over the impact of higher rice prices in exporting countries, especially India, Vietnam, and Thailand. Both India and then Vietnam imposed restrictions on rice exports.

The sudden surge in rice prices remains to be explained. Financial speculation seems to have played only a small role, partly because futures markets for rice are very thinly traded. Instead, decisions by millions of households, farmers, traders, and some governments, based on *expectations* of rising prices, sparked a sudden surge in demand for rice and changed the gradual increase in rice prices from 2002 to 2007 into an explosion. *The psychology of hoarding behavior explains why rice prices suddenly shot up.*

Fortunately, a speculative run based on herd psychology can be ended by “pricking the bubble” and deflating expectations. This happened to the world rice economy. When the government of Japan announced in early June, after considerable international urging, that it would sell at least 300,000 t of its surplus “WTO” rice stocks to the Philippines, prices in world rice markets started to fall immediately (Slayton and Timmer 2008; Mallaby 2008). Once the price started to drop, the psychology reversed in terms of the hoarding behavior by households, farmers, traders, and even governments. By late August, medium-quality rice for export from Vietnam was available for half the price it had sold for in late April. Those millions of small farmers, traders, and consumers that had decided to hoard rice when prices were rising decided they could sell their supplies or reduce the household inventory to normal levels. Demand for rice dried up, and the fall in prices gained momentum.

What was learned? The set of “best practices” recommended by the World Bank after the crisis has a clear logic (World Bank 2009): let high prices be reflected in local markets to signal the necessary changes in resource allocations to both producers and consumers, but protect the very poor from an irreversible deterioration in their food intake status. Efficiency is maintained, and the poor are protected. The difficulty is that food crises are relatively short-lived events (as opposed to chronic poverty). Effective safety nets take a long time to design and implement, and they are *very expensive* if the targeted poor are a significant proportion of the population. Unless a well-targeted program with adequate fiscal support is already in place when the crisis hits, it is virtually impossible for a country to design and implement one in time to reach the poor before high food prices threaten their nutritional status.

The underlying political economy of four decades of coping with rice price volatility, at least as seen through the lens of three countries that the article analyzed in detail, is not hard to discern. In the short run, price stabilization is critical in the poorer countries (India and Indonesia, and Thailand in the early period). Both India and Indonesia learned that they could not stabilize rice prices at low prices because they needed their rice intensification programs to succeed. Millions of small rice farmers respond to incentives, whether in democratic or authoritarian regimes. With higher incentive prices domestically, despite low rice prices in world markets, rice production increased, and growth in consumption slowed. In response to the impact on consumption of higher prices, both countries used physical distribution programs to alleviate the effect on poor households—Raskin in Indonesia and the “below poverty line” (i.e., BPL) program (and others) in India. Both safety net programs are very costly, with low efficacy. But the combination of price incentives to farmers and subsidies to consumers was politically popular in both countries. Prime Minister Singh and President Yudhoyono were both re-elected in 2009 with strong mandates. Part of their popularity stems from the price stability made possible by this approach.

Most of what India and Indonesia did to cope with the world food crisis in 2007/08 violates the guidelines provided by the World Bank and other donors for best practices in dealing with food price volatility. Aggressive use of trade and stocks policy to stabilize domestic prices, combined with in-kind rice distribution programs to the poor, are all included in “policies to avoid.” And yet both governments were rewarded with huge electoral victories in 2009, to the surprise of many outside observers.

Do “bad” economic policies, at least with respect to food price volatility, make for “good” politics? Surely the answer depends on how we define bad economic policies. The argument in this paper was that government interventions to stabilize rice prices in domestic markets should be considered good economic policy if they are done right. Academics and donors mostly denied this possibility, thus cutting government officials off from helpful dialogue, technical assistance, and funding to make these interventions more transparent, cost-effective, and supportive of market development. A different approach was needed if the policy dialogue was going to be more fruitful. This new approach is spelled out in the next three “milestone” papers.

5. “Behavioral Dimensions of Food Security,” published August 2010 online and in print in the *Proceedings of the National Academy of Sciences (PNAS)* in July 2012, was an invited contribution to a special issue of PNAS addressing the world food crisis in 2007/08 (Timmer 2010a). In the article, I tried to examine the micro behavioral foundations of decision making by food consumers and producers with analytical terminology directed specifically at micro economists. I was trying to explain the micro foundations of the macro dimensions of food security.

Perhaps the most important element of food security in the minds of most Asian citizens is the fear of a food crisis when prices spike or staple foods (especially rice) disappear from the market. Accordingly, preventing food crises through better understanding of their fundamental causes, thus allowing implementation of better food policies,

needed to be a high priority for food policy analysts. Once a food crisis hits, coping with its consequences becomes the main task at hand, with emergency food aid and other forms of safety nets hastily brought into play. But preventing food crises in the first place, especially by preventing sharp spikes in food prices, is obviously a superior alternative if a way can be found to do it. Understanding the behavioral dimensions of food security is an important step in learning how. New insights from behavioral economics explain why governments should stabilize basic food grain prices (Timmer 2012). With a better understanding of “why,” it is possible to suggest better approaches to “how.”

Highly volatile food prices—sharp spikes and price collapses—are undesirable for two separate reasons. First, it is increasingly recognized that volatile staple grain prices have serious consequences for economic welfare, especially for the poor (Timmer 1989; World Bank 2005; Timmer and Dawe 2007; IFPRI 2008). Second, and the new argument in the paper, spikes in food prices universally evoke a visceral, hostile response among producers and consumers alike. This response has deep behavioral foundations—the experimental and psychological literature shows clearly that individuals strongly prefer stable to unstable environments. Kahneman and Tversky (1979), for example, in their path-breaking treatment of decision-making under risk, establish “reference points” for individual decisions as the basis for the widespread “loss aversion” that is the foundation of what they call “prospect theory.”

The pervasiveness of loss aversion among individual decision-makers has immediate implications for how we should think about welfare losses from unstable food prices. Equal movements in prices up and down over time leave society *worse off* because the welfare losses from such price movements always outweigh the welfare gains. The asymmetry of welfare losses caused by loss aversion means that the “gains to trade” possible when prices are unstable will be less than the losses.

Bernheim and Rangel (2005) stress the seriousness of the challenge from behavioral

economics to mainstream welfare analysis, which is based on the principle of revealed preferences, a challenge first presented by [Duesenberry \(1949\)](#), and revived by [Kahneman and Tversky \(1979\)](#). If revealed preferences from choices about consumption, income generation and time allocation, for example, are not “really” what individuals prefer, or they incorporate what others are doing, as the experimental evidence from behavioral economics suggests, *the normative foundations of consumer theory no longer hold*. Without these foundations, such stalwarts of applied welfare analysis as consumer surplus no longer have a theoretical basis. The consequences are obvious: models that international economists use to prove the existence of “gains to trade” no longer hold, and *theoretical arguments against stabilizing prices also disappear*. Most tellingly, models based on competitive trade, whether domestic or international, that show welfare gains to consumers from food price instability are simply irrelevant in the face of the behavioral evidence. This result alone explains much of the “empirical” political economy of food prices.

Although it is conceptually possible to hedge the risks from unstable food prices, or to mitigate their welfare consequences for the poor using safety nets, there are no markets in which to purchase stability in food prices directly. Citizens would willingly go to the market to buy food price stability, but such a market does not exist, no doubt because the private coordination costs are too high. *Food price stability is a public good, not a market good*.

Understandably then, citizens turn to the political market instead, although the costs of providing price stability as a public sector activity can also be very high, especially if public food agencies are poorly managed and become highly corrupt. But only political action and public response from governments can provide stable food prices. Thus, food becomes a political commodity, not just an economic commodity, and we will need a “behavioral political economy” to understand food policy. *Understanding the behavioral foundations of formation of price expectations will be critical to building this new political economy*. In

particular, the dynamics of herd behavior and the tendency of bad news—about terrorism, wild fires or a sudden rise in rice prices in local markets—to serve as a “focusing event” in stimulating simultaneous, spontaneous behavior that results in panics provide robust insights into how individuals form price expectations and respond to them ([Tversky and Kahneman 1986](#)).

Governments that fail to stabilize food prices have failed in providing a quite basic human need that is rooted in behavioral psychology—the need for a stable environment. Governments that are successful in stabilizing food prices are usually rewarded politically; witness the landslide victories for Prime Minister Singh in India and of President Yudhoyono in Indonesia in early 2009. Both candidates campaigned openly on their ability to bring their countries through the world food crisis with minimal impact on domestic food prices. Clearly, other factors contributed to the electoral success in both countries, but it is equally clear that the governments’ abilities to provide stable food prices when the rest of the world was experiencing a food crisis were politically popular. The trick, of course, is to provide stability in domestic food prices at low cost to economic growth, participation by the poor, and government finances. By and large, Asia has figured out how to do this as a domestic endeavor, but with large negative spillovers to world markets ([Timmer 2009b](#)).

6. “What are Grain Reserves Worth? A Generalized Political Economy Framework” appeared in a 2014 Festschrift for Hal Hill, the “dean” of economists specializing in Indonesia in particular and Southeast Asia more broadly ([Timmer 2014b](#)). Hal has been a long-time friend and colleague, and I was eager for my contribution to make a significant contribution to issues we both cared about. I used the opportunity to integrate much of my earlier work on the role of grain reserves in building confidence among government officials to trust international grain markets to play a regular role in domestic food policymaking. I was concerned that the “drives to self-sufficiency in rice” that became popular after

the 2007/08 rice crisis were doing substantial damage to the welfare of the poor in Asia by making rice production much more expensive, and less stable, than had been the case when rice imports and exports were routinely used as a “balance wheel” to manage rice price stabilization programs. I regard this contribution as the basic “concept paper” for how to stabilize rice prices from a political economy perspective.

There are four basic ways that policy analysts approach the valuation of grain reserves.

The first is second nature to economists, who use *basic supply and demand models* as the fundamental explanation of price formation. The “fundamentals” approach uses these models to generate an equilibrium price, where the global level of stocks is an exogenous factor that influences the probability of a price spike when there are shocks to supply or demand. A number of well-calibrated models using this structure are used routinely, especially by international research centers such as the Food and Agriculture Organization (i.e., FAO), the Food and Agricultural Policy Research Institute (i.e., FAPRI), and the International Food Policy Research Institute (i.e., IFPRI) to understand the impact of changing trends in supply and demand, and shocks, on food prices.

The second approach explicitly introduces the storability of the commodity into price formation. The “*supply of storage*” model brings in expectations and makes stock levels endogenous with price formation. To be empirically useful, however, reasonably accurate, and timely data on levels of stocks held by the commercial trade are critical, and such data are often held in secret. These models have a long history, but the standard reference remains (Williams and Wright 1991).

The third approach recognizes that timely stock data are often not available for commodities where individuals and small firms hold a major share of stocks between harvest and consumption, a factor that is especially important for the world rice market (Timmer 2012). To cope with this reality of the industrial organization of some commodity markets, a *behavioral model adds hoarding*

by individuals, with levels of stocks in the hands of these agents largely unobserved but important for short-run price formation. In this approach, “non-traditional speculation” in financial and commodity markets can also impact price formation without having a visible impact on measured stock levels, thus making the traditional supply of storage model irrelevant (Timmer 2008b; 2013).

The fourth approach builds a political economy model that adds the *behavior of policymakers* (and other market participants) to explain changes in trade restrictions for grain (especially rice). Such trade restrictions were an important cause of the spike in rice prices in 2008. “Confidence in trade” is a critical driver of political behavior because it is possible to rely more on open markets when adequate public stocks are on hand. More open markets, especially fewer ad hoc restrictions on exports, lead to less price volatility in world markets. Domestically held stocks contribute directly to confidence in trade, in a positive manner. In this model, levels of grain stocks held domestically are an important factor in explaining price volatility, above and beyond their impact via the supply of storage model and even the private hoarding model.

7. “How to Manage a Food Crisis: A Viewpoint” was published electronically in mid-September 2022, shortly after it was submitted to the *Asian Journal of Agriculture and Development*. The paper started with a quick description of the challenge:

As this is written in mid-September 2022, the world is facing a potential food crisis worse than any since World War II. With a devastating war in Ukraine launched by Russia in late February 2022, an historic drought and heat wave in China, and an uneven monsoon in South Asia, food supplies from several of the world’s largest granaries are highly uncertain at best, and genuinely scary at worst. What should we do? (Timmer 2022c, 1)

The article reviewed in nontechnical language the history of thought just presented in the first six papers in this list, and then turned to the food

crisis that was emerging. ASEAN received praise for the lessons it had learned after the 2007/08 rice crisis:

- (1) Build up rice stocks in importing countries, so they do not get caught in a rising price spiral.
- (2) Don't panic! Talk through the food security issues at ASEAN summit meetings held twice a year.
- (3) As evidence: The food price spike in 2011 included wheat, corn, and soybeans/ vegetable oils, but *not rice*. World rice prices have been relatively stable since, despite considerable fluctuations in the prices of other staple foods on world markets.

The timing of the article was critical, as it was distributed immediately to the team of advisors helping Indonesia manage the G-20 Summit Meeting held in Bali in late November. Its reception there was quite positive. Fortunately, the world community mobilized around the food crisis in promising ways. In particular, proposals were generated for collective action that were incorporated in the Summit Declaration issued at the end of G20 Summit Meeting, chaired by the President of Indonesia.¹²

I think of this paper as the “proof of concept” on “how” to stabilize food prices. It assumes the relevant government decision makers fully understand “why?” They just need to know what to do. In two words, the advice is “don't panic.”

In the context of the multiple challenges in the early 2020s to global food price stability, this article addresses Asian government leaders directly on the policy choices available. The paper is unlikely to generate many citations, as it is aimed at policymakers rather than policy analysts and academics. That said, it may be one of the most consequential papers I have ever written.

SOME FINAL THOUGHTS

In closing, some general guidelines are in order. Because the desirability of stable rice prices is so widely understood by policymakers throughout Asia, two natural questions immediately follow:

1. How stable? If a little stability is good, is a lot of stability better?
2. At what price level? How should domestic prices relate to prices on the world market?

There is no theoretical or historical answer to either question except “it all depends.” Much of the skill in policy advising comes from discovering, in each unique circumstance, on *what* it depends. Government finances are always critical, but often, the capacity of the private sector to buy and manage rice stocks or the ability (and willingness) of consumers and farmers to cope with rice price fluctuations will determine the answer.

In my experience, some rough guidelines provide a useful starting point for the analysis:

1. Try to keep domestic rice prices in line with long-run price trends for equivalent qualities of rice in the world market. Determining the *relevant* long-run trend is mostly a matter of financial resources. For most poor countries, the *current* price is all that matters. At the other end of the spectrum, Japan has kept its domestic rice price well above the world price for generations.
2. Significant importers, such as Indonesia or the Philippines, might want to maintain a “food security” premium of perhaps 10 percent *above* the world price. A larger premium puts a heavy burden on domestic rice consumers, many of whom are quite poor.
3. Significant exporters, such as India, Vietnam, and Thailand, might want to aim for stable domestic prices about 10 percent *below* the trend in world prices. A larger discount penalizes even efficient rice producers and reduces rice supplies to the world market.
4. No matter what, *credibility* of the stabilization policy is absolutely critical to its success. No government price policy is credible if

12 The elements of a possible G20 Communique on Food Security were outlined in Timmer (2022a), and these provided input to the formal declaration issued at the conclusion of the summit.

(a) the treasury cannot afford it, (b) it drives the private rice marketing sector out of business, and (c) most rice ends up being traded in illicit black markets.

Putting specific numbers on these general guidelines requires on-site analysis using the best available data and skilled local policy analysts. Do not believe that someone sitting in Washington or Brussels knows the answer.

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