Mendeleev's Periodic Table

It remains an invaluable resource for classification in its 150th year

TECH-ENABLED

DEVANGSHU DATTA

In March 1869, Dmitri Ivanovich Mendeleev presented a chart to the Russian Chemical Society. This is generally considered to be the first Periodic Table. It was a spreadsheet listing all the known elements in groups. The Table remains a basic tool of chemistry. The latest new entries were added in the 21st century, almost 150 years after the first table was prepared.

It was an incredible achievement. Little was then known about molecules, or atoms, and the existence of fundamental particles had not even been suspected. Despite that, Mendeleev had discovered what are called the Periodic Laws: He found that elements arranged in order of their atomic weights, could be grouped in terms of similar properties at regular intervals.

Mendeleev's original table contained just 63 entries. But he predicted that new elements would be discovered, and left gaps in the table where he guessed that those elements would occur. He also predicted what the chemical properties of the new elements would be.

The Table was built upon the calculations of atomic weights, also often called the relative atomic mass. In the 19th century, chemists measured the mass of equal volumes of various elements and compared those masses relative to the mass of hydrogen, which is the lightest element. Hydrogen was assigned the value of 1. Thus, carbon, which is about 12 times as heavy as hydrogen, has the atomic weight 12. (Carbon is the modern standard for atomic weight.)

Later discoveries would lead to the understanding that most hydrogen atoms consist of just one proton. Other elements have higher atomic weights, because their atoms possess more protons and neutrons.

It was only in the 1930s, after the discovery of the neutron and proton, that elements started being classified according to the number of protons, rather than the atomic mass. Nowadays, the Table uses atomic number — this is the number of protons in each atom.

The atomic number is unique to every element, since the number of protons in the nucleus will be the same. The atomic weight may differ for different isotopes of the same element, since there may be a different number of neutrons. Hydrogen for example, has three naturally known isotopes. These are naturally stable hydrogen ("Protium") Deuterium and Tritium with the respective atomic weights of 1, 2 and 3. All the isotopes have an atomic number of 1.

Many elements are hard to find in nature due to being radioactive. Radioactive elements emit particles and transform into more stable elements. Many radioactive elements have brief half-lives — within a few minutes or seconds half the mass on average, will be transformed into a more stable element through decay.

The Earth has existed for over 4.6 billion years. Many elements with relatively short half-lives may have been present but have decayed to the point where they can no longer be found. Such highly radio-active elements can be synthesised by pumping protons into the nucleus of more stable elements.

Meitnerium for example, is a synthetic element with a half-life of just 4.5 seconds. It can't be found in nature. Many isotopes of common elements such as oxygen -12 and hydrogen -7 are also fleetingly seen in labs because they have half-lives of just fractions of a second.

As chemists started to hunt for new elements, the Table was gradually filled. All the elements between Hydrogen (Atomic no 1) and Plutonium (94) occur naturally on Earth. But many of these were synthesised first, before being discovered in nature.

From 95 (Americium) onwards, all the elements have to be synthesised. The first element discovered via synthesis was Technetium (At no: 43) in 1937. Mendeleev had predicted its existence and called it "Ekamanganese". It does occur naturally. The first completely synthetic element was Curium , discovered in 1944 by bombarding plutonium with alpha particles.

The most recently discovered element was Tennessine (At no: 117) which was found in 2010 by American-Russian collaboration. Researchers at the Joint Institute for Nuclear Research in Dubna (Russia) bombarded Berkelium (At Wt 97), itself a synthetic element, with Calcium (At Wt 20) beams to force the Calcium protons to merge into the Berkelium atoms. Similar bombardment led to the earlier discovery of Oganesson (At Wt 118) in 2002.

Very little is known about the properties of the transuranic elements (beyond At Wt 92) because most are synthetics with short half-lives. Studying them in labs to discover their chemical properties is hard. At the same time, researchers are trying to find elements at 119 or beyond. The Table remains an invaluable resource for classification in its 150th year.

CHINESE WHISPERS

Queen of controversies

Uttar Pradesh Minister of State for Women's Welfare Swati Singh *(pictured)* is in the news again. Singh, who had courted controversy in May 2017 after a video showing her inaugurating a beer bar in Lucknow went viral, is in the dock again after an audio clip surfaced, in which she was heard admonishing a senior police official for registering a case against realtor Ansal Developers. In the audio, Singh is purportedly instructing the woman cop to drop the case, or else face the music. Her aide misbehaved with the media when reporters sought her response on the controversial audio. Thereafter, Singh was summoned by Chief Minister Yogi Adityanath, who has also sought a detailed report from UP Director General of Police O P Singh on the episode.

Rein in the enthusiasm

Too much enthusiasm can ruin one's electoral prospects. A former Delhi Municipal Corporation councillor of the Bharatiya Janata Party (BJP) has learnt this the hard way. Last week, one of the senior-most leaders of the Delhi BJP was hosting a bunch of party leaders for an informal meeting when the ex-councillor reached uninvited and started discussing the possibility of getting a ticket for the upcoming Assembly elections in Delhi. Now, lobbying for tickets is not unusual but the party leaders were of the view that the aspirant had chosen the wrong forum and timing. Despite many of them dropping hints that the aspirant should leave, he stayed on, infuriating them further. It is learnt that the party leaders have decided that this person is not to be given the ticket because he failed to present his case in the right manner.

Real pollution, fake picture

As the pall of polluted air continued to shroud Delhi and other parts of north India, a viral photograph purportedly showing the Paribesh (environment) Bhawan in Kolkata, which houses the office of the West Bengal Pollution Control Board, threatened to rake up a storm. The photograph showed the outside walls of a building which had rows and rows of air-conditioning machines. Many started criticising the West Bengal government, saying how the picture represented a contradiction — the institution that is supposed to fight pollution was actually contributing to it! Within days the picture was busted as fake but not before conspiracy theorists pointed out how the photo was manufactured to take attention away from stubble burning on the outskirts of Delhi.

All you wanted to know about banking frauds

Bankers feel inhibited talking about frauds for fear of loss of reputation. Large frauds usually come to light after 54 months

BANKER'S TRUST

TAMAL BANDYOPADHYAY

Many of us have seen different versions of a funny television ad promoting men's deodorant brand Fogg. The settings of the ad vary from a grocery store to a hospital, café and even the India-Pakistan border but the conversation between two characters remains unchanged: *"Kya chal raha hai?"* (What's new?) *"Fogg chal raha hai"* (Fogg is new).

Change the 'F' word — Fogg to fraud. This has been playing out in Indian banking and finance for quite some time. In the first week of November, the Central Bureau of Investigation (CBI) carried out searches at close to 200 locations across 16 Indian states and Union Territories. At least 1,000 officers of the agency were involved in the action, making it one of the largest coordinated searches this year, a PTI report said. The CBI did so after registering 42 fresh cases, involving at least ₹7,000 crore worth of fraudulent transactions. In at least four cases, the siphoned off funds crossed ₹1,000 crore.

The Association of Certified Fraud Examiners, the world's largest anti-fraud organisation that offers training to detect frauds, is observing Fraud Week between November 17 and 23 to create anti-fraud awareness. It's time to take a close look at what's happening on the fraud turf in Indian banking and finance.

For the record, ₹71,500 crore worth of frauds involving 6,801 cases were detected in financial year 2019 — little more than what the government of India wants to spend on the merger of Bharat Sanchar Nigam Ltd and Mahanagar Telephone Nigam Ltd as well as the latest recapitalisation package for public sector banks (PSBs). Incidentally, at least 92 per cent of these frauds in value involved the PSBs that have around 55 per cent share in the volume of such frauds.

Going by numbers, it's just about 15 per cent more than the previous year but, in value terms, 80 per cent higher. Around 73 per cent were large-ticket corporate frauds worth over ₹100 crore each. One such case involved designer jeweller Nirav Modi and his uncle Mehul Choksi, who, with the help of Gokulnath Shetty, a retired deputy manager of Punjab National Bank's (PNB's) foreign exchange department at the Brady House branch in Fort, Mumbai, siphoned off ₹13,000 crore.

Of course, not all frauds happened last year. Like many other things in the financial sector, here too we see the so-called lag effect. Typically, frauds are detected on an average after two years and, going by the Reserve Bank of India (RBI) estimates, large frauds worth more than ₹100 crore each usually get detected in 54 months on an average. The PNB fraud was done over a period of at least 84 months.

So far this year, the RBI has penalised banks ₹123 crore for non-reporting or delaying in reporting 76 frauds. The list includes 11 banks that were penalised ₹8.5 crore for not complying with the norms to classify the now-defunct Kingfisher Airlines Ltd account as fraud and report to the regulator despite being advised by the RBI to report the fraud "immediately" after the CBI initiated criminal proceedings.

Most frauds are related to credit; the share of frauds originating from the misuse of credit cards and internet is minuscule. In many cases but not all, "insiders" (read bank managers) played a role. The corporate-banker nexus may not be rampant but it does exist.

Let's take a look at the various types of bank frauds in India.

- Fund transfer through RTGS and other clearing platforms: Typically, money is taken out of a customer's account through fake/cloned cheques. It also involves, at times, fraudulent collections of demand drafts, issued by a third party.
- Dormant accounts: The branch bankers play a key role to make such accounts active by issuing new ATM cards and cheque books to perpetrate withdrawal of money from such accounts.
- Home loans: There are multiple ways of defrauding banks. For instance, the builder can sell one flat to many customers; the borrower can take a loan for a property already sold to another person; a person can be given loans more than what s/he can service either by forging earnings statement or with the help of branch bankers; the property value can also be inflated.
- Advance against bills: Forged export bills and letter of credit help such frauds. The borrowers can also route their export proceeds through other banks.
- Gold loans: The borrowers can get higher loans inflating the value of gold pledged to the lender or even against spurious gold with the "help" of the valuer and branch bankers.
- Kisan credit cards or KCC: Such loans can be sanctioned without checking the KYC of the borrowers and the authenticity of the land records. Many a time, the borrowers are not traceable.
- ATM: Money is withdrawn using cloned ATM cards.
- Cash credit: Frauds involve falsification of the books of accounts and removal of goods and property hypothecated to the banks without their knowledge.
- Term loan: This is the biggest contributor to the frauds. The borrowers at times raise more money than they should, forging financial statements; they divert funds; they route the sales proceeds of their companies through banks outside the consortium (which has lent to them), and raise export credit through fake export orders. Among others, non-existent collaterals complete this list.

The banks are normally hesitant about talking about the frauds, fearing reputational risks. There are those odd cases when they are caught between different agencies and regulators. The Kingfisher episode is one such. The fear of being dragged into fraud cases and punished also slows down the decision-making process and credit flow.

The Central Vigilance Commission in August, in consultation with the RBI, reconstituted the Advisory Board on Bank, Commercial and Financial Frauds, renaming it Advisory Board on Banking Frauds to address this. This board will be the first stop for all large fraud cases before recommendations are made to the investigative agencies by the PSBs. It won't deal with cases that involve senior bankers of the rank of general managers and above.

While this may encourage banks to talk about frauds and feel less inhibited to take credit decisions, tackling the frauds is a much tougher task.

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INSIGHT

Can empathy reduce the probability or impact of crisis?

Picking out the emerging risks, planning for a quick response and packing empathy in the response are the three must-dos to protect reputation

MITU SAMAR

While flipping through the newspapers something unusual caught my eye: "NCLT orders insolvency proceedings against Aviva Life Insurance". I hadn't heard of any major controversy around the company, hence was shocked to know about this development. On reading the details, I discovered that there was a dispute of around ₹27 lakh with the Apeejay Trust, which had leased its Mumbai-based commercial premise to the company. The trust reported the matter to the National Company Law Tribunal (NCLT) and eventually insolvency proceedings were ordered. This piece of information set me thinking. Keeping business differences and the probable reasons for the dispute aside (especially as I have access to only publicly available information), this episode seems unheard of. Both the disputed amount and the outcome seem to be at extremes.

This reaffirmed my belief that the risk landscape of corporates worldwide is undergoing a complete transformation and it is pertinent for them to be mindful of this transformation. Otherwise, the price is being paid in the form of reputational loss along with extreme business implications. Even in the case of Aviva Life Insurance, possibly the final outcome may not be as grave as it seems yet the apprehensions developed in the interim in the minds of various stakeholders will cause a significant loss to the company's reputation. Thus, it is time that the corporates have a detailed understanding of this changing landscape and make crisis management an important part of their strategy document.

Another telling example is the recent development when WeWork IPO was stalled. WeWork was considered among the most valued start-ups. But now the situation has completely reversed. The gaps identified through the financial submission of IPO documents highlighted huge discrepancies. When this information became public, investors became more cautious and deeper investigations threw up an ugly picture. The founder CEO was ousted and the new leadership team was in place. Its biggest investor, Softbank, has now taken the centre stage and is implementing various measures to bring the company back on track. But, the loss of reputation is not reversible. Tighter regulatory scrutiny has become a reality and companies can no longer get away with books and records that are not up to the standards. The speed with which information travels now, no one including regulators has ample time to explain their side of the story. Hence abundant caution has become a norm, which while undoubtedly has it's own merits, has also added new dimensions to business risks that were missing earlier.

In addition to business risks, empowering provisions like whistleblower policy, Prevention of Sexual Harassment Act, appeal to NCLT cannot be ignored. Earlier it was a known fact that if an individual or even a group of individuals were fighting against an organisation, the power equation mismatched. However, now scenario is changing with the world digitally connected and individuals voicing their opinion through their own social media platforms. The power of one cannot be ignored.

For instance, the famous case of racial discrimination Starbucks faced in April 2018 when in one of its stores in Philadelphia two black men were arrested while waiting for a friend. They were taken in police custody and held for hours before they were released without being charged. What could have been otherwise a local episode soon became global. Social media lit up, pointing out how white people were treated differently in similar circumstances. Many past incidents were raked up and Starbucks was labelled as a biased organisation. Being a global B2C company this was a huge challenge for the company. It immediately accepted the responsibility, apologised and took quite a few corrective actions that proved effective in showcasing their genuineness. A letter from the chief executive officer to employees and customers was posted online. They closed 8,000 stores worldwide for a day to provide racial bias training for their 1,75,000 employees. While this caused the company an estimated loss of business of more than $12 million, it helped the company gain a positive association.

These challenges and anecdotes clearly point towards the changing trend. Contours of risks are changing and more importantly, moving towards human emotion driven risks. All the cases mentioned above are outcomes of human behaviour guided by emotion. The need to forge the numbers or keep financial records sub-par, the impatience to the path of success, the ego to not treat fellow human beings as one or the lack of agility to adhere to regulatory requirements and so much more. Each of these is an outcome of human emotion or intention. In fact, simple cases where a customer gets irked at the company is not because his or her issue was not solved but due to the tone that the service executive adopted. Similarly, during lay-offs, the tone or the message that the organisation adopts is extremely critical for the employees to not get emotionally affected and bad mouth the company. Companies have to recognise this. In this world of digital solutions and virtual connects, emotions are taking a back seat. And that is exactly what is sowing the seeds of potential crises. The recent apology of Vodafone CEO, Nicholas Read is another classic example that highlights the significance of an organisation's ability to distinguish between the issue and the emotions and sensitivities associated with it.

Is this transforming corporate risk landscape all that complicated to manage? Not really. Picking out the emerging risks and listing them, planning in advance for a quick response and packing empathy in your response are the three must-dos to protect your reputation in this viral world.

The author is founder, Eminence, a reputation management company

LETTERS

Sooner than later

This refers to "SC junks Rafale review pleas..." (November 15). The unanimous decision by the Supreme Court bench on the Rafale deal is welcome and should now put everything straight. Hopefully, we will see the complete fleet of Rafale fighter jets at the earliest in our Air Force. What is really heartening is that not only this bench dismissed the review petition but also the allegations that the government was responsible for the inclusion of Anil Ambani's Reliance Defence as an offset partner.

Though Congress leader Rahul Gandhi's unconditional apology saved him from contempt charges, the party is again trying to create a storm out of nothing by asking for a joint parliamentary committee probe. If the Congress wants to put the ruling party BJP under the cosh, there are other grave issues like the slowdown in the economy and unemployment. If the Congress still does not learn its lessons, then it will have to pay a price sooner than later.

Bal Govind Noida

Alternative solution

This refers to "Apex court strikes down Finance Act rules on tribunals" (November 14). In recent times, the government's decision of passing the Financial Act 2017 as a Money Bill in order to get smooth passage in Parliament has come under much scrutiny. A Money Bill can only be introduced in Lok Sabha and Rajya Sabha doesn't have the power to block the passage of the Bill once the Lok Sabha passes it. Many in the Opposition believe that the government declared it as a Money Bill on purpose to avoid voting in the Upper House as it does not have a majority in the Rajya Sabha.

Our Constitution gives supremacy to the Lower House when it comes to passing a Money Bill. It is felt that declaring a particular Bill as Money Bill by the Lok Sabha Speaker must not leave any scope for doubt. The constitutional provision in this regard may need to be altered, if required, so as to put any dispute to rest at the initial stage itself. The Speaker may be mandated under the revised provision to seek advice from the Supreme Court before certifying a Bill as Money Bill. Alternatively, a panel comprising the Lok Sabha Speaker, the Rajya Sabha Chairman and a sitting Supreme Court judge may decide the same. This will avert any constitutional crisis.

Sanjeev Kumar Singh Jabalpur

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HAMBONE

Business Standard
Volume XXIV Number 67
MUMBAI | MONDAY, 18 NOVEMBER 2019

Saving the telecom sector

Govt should prevent a near-monopolistic situation

The telecom industry is under severe stress — evident in the second quarter results of the two leading players. While Vodafone Idea has posted the biggest loss that corporate India has ever seen in a quarter, for Bharti Airtel the loss was the highest in its 24-year history. Together, the two top telcos' July-September quarter net loss ballooned to ₹74,000 crore due to the provisioning they had to make for the adjusted gross revenue (AGR) dues. According to a recent Supreme Court judgment upholding the government definition of AGR, telecom service providers must pay up their past dues on licence fee as well as on spectrum usage charge (SUC) by the end of January 2020. The Department of Telecommunications (DoT) has asked all service providers to calculate their respective dues and pay up in three months as directed by the apex court. Estimates suggest a total payout of around ₹1.33 trillion by telcos, including by those who have been acquired or gone out of business.

As both Bharti Airtel and Vodafone Idea have raised doubts over continuing as "going concerns" in the backdrop of huge losses, piling debt, and pending AGR dues, the government has to step in fast. Union Finance Minister Nirmala Sitharaman has shown the way by saying that she doesn't want any telecom firm to shut down and would like each of them to flourish. That should translate into concrete action soon.

Without any relief from the government, British telecom major Vodafone may decide to exit the India market. This would adversely impact the overall business sentiment, especially the foreign investment climate. The company has been among the biggest sources of foreign direct investment for India. Vodafone Chief Executive Nick Read told the media last week that "if you're not a going concern, you're moving into a liquidation scenario — can't get any clearer than that", while blaming the regulatory environment for much of the woes. Subsequently, he wrote to Prime Minister Narendra Modi, saying he was quoted out of context and that Vodafone wanted to stay invested in India. However, the numbers tell the real story, and indeed the road ahead for not just Vodafone but the entire telecom industry hinges on a potential relief from the government. So far, the indications are that the government may lower the licence fee and also give a moratorium on paying spectrum charges. The industry expects the option of a long-term staggered payment of the AGR dues, besides a waiver on penalties and interests. Although it may be a challenge for the government, facing a revenue shortfall, to allow such concessions to telcos, not doing anything is no longer an option.

It is correct that the incumbent telcos in the past indulged in high bidding during spectrum auctions, hitting their bottom line. Pricing by competition pulled them down further, leading to a situation where only two private telcos may remain with only one holding on as a strong player. It is equally true that the telcos failed miserably in providing for the potential liability in their balance sheet over the years. But to prevent a near monopolistic situation, further job losses, and erosion of business confidence, the government, which appropriates about a third of the revenues of each player through various levies and taxes, must act.

Data credibility at stake

Unfortunate fiasco over consumer spend survey

The credibility of the Indian statistical system has come under scrutiny yet again, after the government on Friday decided to scrap the consumer expenditure survey, conducted by the National Statistical Office (NSO) during 2017-18, because of "data quality issues". The decision came after the findings of the withheld report were published in this newspaper. According to the survey, compared with 2011-12, monthly per capita consumer expenditure fell by 3.7 per cent in 2017-18 — the first decline in at least four decades. While spending in urban areas went up by just 2 per cent, it registered a massive 8.8 per cent decline in rural areas. The government's decision to reject the report means India will not have a new poverty estimate until the next survey is undertaken. The revision in the gross domestic product (GDP) base year would also have to wait.

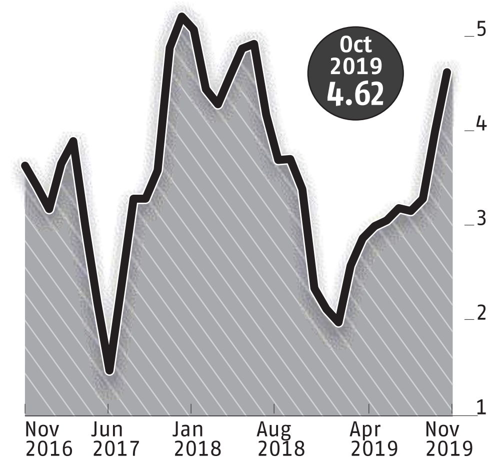
The findings of the survey and the way the government handled the issue have raised several concerns. First, since overall economic growth has slowed significantly since 2017-18, it is likely that consumption expenditure in rural areas might have slipped further. This is worrying and indicates a reversal in poverty reduction. Second, the government seems to have no faith in the data presented by the NSO. Simply rejecting the survey has raised questions over whether the decision was prompted by the government's unwillingness to accept data that doesn't suit its narrative. It is possible that the results were significantly affected by demonetisation and the introduction of the goods and services tax. The government had also withheld the periodic labour force survey, which showed the unemployment rate at 6.1 per cent, a 45-year high. The report was released with the same data after the general election results were announced.

Third, as this newspaper has reported, there is a significant difference between the Central Statistics Office and NSO estimates of consumption. While the difference itself is not new and unique, the widening divergence deserves attention. Since the CSO and NSO data on consumption presents a completely different picture, it is bound to raise questions about the efficiency of the statistical system. Therefore, it is time to revamp India's statistical system and enable it to collect, process, and disseminate information with speed and accuracy. The GDP data, for instance, comes with a significant lag and is subject to large revisions, which affects decision making.

At a broader level, the importance of credible and timely data cannot be overstated. Decision making in both the government and the private sector depends on the state of the economy. It is important to note that the GDP data is already under a cloud because it doesn't match high-frequency indicators. Withholding data and rejecting official survey results will further damage the credibility of the system. Non-availability or the unwillingness of the government to accept survey findings will hurt its ability to make policy decisions. Further, the private sector would be reluctant to invest if it doesn't have a clear picture of the economy and suspects official data. The government would be well advised to address the problems in both the economy and the statistical system. Being in denial mode is no solution.

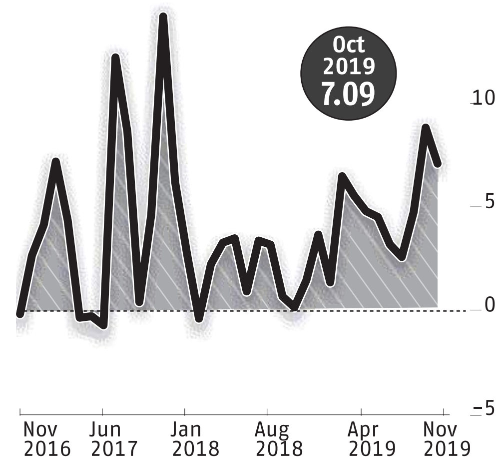
HEADLINE INFLATION

Y-o-Y growth (%) Figure 1



MONTH-ON-MONTH INFLATION

M-o-M SAAR (%) Figure 2



What should monetary policy do?

The recent inflation data is not a serious problem for the Monetary Policy Committee

SNAKES & LADDERS

AJAY SHAH

From the viewpoint of the accountability of the Reserve Bank of India (RBI) to Parliament and the public, it makes sense to focus on year-on-year changes of the consumer price index (CPI). This is comprehensible for a non-technical audience. This "headline inflation" has accelerated from the bottom of 1.97 per cent in January 2019 to 4.62 per cent in October 2019 (*see Figure 1*). In October 2019, this went above the inflation target of 4 per cent, though it must be noted that the RBI is required to hold headline inflation in the range 2-6 per cent.

Some people are concerned that the inflation rate has accelerated and there may be a case for rate hikes by the RBI. It is important to observe that when the headline inflation rate dropped to 1.97 per cent for one month, this was outside the targeted range, which runs from 2 to 6 per cent. When the inflation target is 4 per cent, we should be happy that we have stepped away from breaching the targeted range (1.97 per cent) to being back near the target (3.99 per cent in September and 4.62 per cent in October).

Looking beyond the black box accountability, we must switch from headline inflation to month-on-month changes, computed using seasonally adjusted data (*see Figure 2*). Seasonal adjustment helps us look beyond practical problems like the Kharif harvest and Diwali demand; we get to see the underlying reality after these ephemera have been removed from the data. Each value of year-on-year inflation is the average of the latest 12 values of month-on-month inflation. Perusing the latest value of year-on-year inflation shows us what was going on in the economy in the past one year. Looking at month-on-month inflation shows what is going on in the economy right now. The month-on-month inflation rate peaked at 8.84 per cent in September and actually declined to 7.09 per cent in October.

As *Figure 2* shows, a value of 7.09 per cent for one month is not an unusual value in the month-on-month inflation experience. In the past, individual months have seen bigger values such as 10 per cent or worse, while the overall performance of headline inflation was under control, i.e. within the range from 2 to 6 per cent.

The task of the monetary policy committee (MPC) is to look deeper, at the underlying economic conditions. Monetary policy is hard because there is a lag between the move by the MPC and its impact upon the economy. Every MPC has to peer into the future, have a sense of the forces at play, and anticipate how inflation is going to shape up over a year or two. When we look back at the performance of the MPC, it is easy to know when the MPC got it right versus when the MPC got it wrong, by looking at inflation outcomes about one to two years after the decision. As an example, the Indian MPC had two episodes in Figure 1 where the inflation rate was at the bottom end of the range: this shows that a year or two prior to these events, monetary policy was too tight.

When we look at the economic situation today, particularly when we look beyond the GDP data, we are not in buoyant business cycle conditions. It is unlikely that there will be a resurgence of utilisation of capacity, and tightness in the labour market, which can kick off inflation. Hence, our view of inflation at future dates (of about one to two years into the future) should be relatively benign.

In fact, our problem today is not that the policy rate is too high. Our problem is that it has not filtered through most of the economy. Under normal conditions, the Indian bond-currency-derivatives nexus works poorly, which gives a weak monetary policy transmission. On top of this, right now, many financial firms are impaired; they are focused on their own survival and not on business opportunities. Lenders have pulled back from many sound borrowers. Under these conditions, the reality of access to credit and the price of credit, for a large number of people in the economy, is very different from the picture seen in the 91-day treasury bill rate (which is the de facto indicator of monetary policy).

At the same time, the solution does not lie in government fiat, in orders to financial firms to change interest rates in certain ways. We have to look deeper. There are reasons why the financial firms are behaving as they are. What is required is deep knowledge about financial sector policy, and financial reforms that go to the root cause of the problems in the financial system.

As an example, administered interest rates are an important problem. When the inflation rate is at 4 per cent, the interest rate of 8-9 per cent for the Employees' Provident Fund (EPF) or Public Provident Fund (PPF) works out to 4-5 per cent in real terms. In the past, the real rate of return for the EPF or PPF was about 1 per cent. There is a need to bring down the EPF/PPF rate to about 5 per cent in nominal terms, in this new environment.

Some people think that given the difficulties in the economy, it is time to abandon the inflation target and crashing the policy rate. A little institutional memory will help. We should recall the hardship of economic policymakers of the past — fighting high inflation. Of the many problems that we see in India today, it is a relief that inflation surges are not one of them. When the full institutional power of the RBI is devoted to one thing — delivering a headline inflation rate of about 4 per cent — this removes one element of uncertainty from the picture.

To earn the respect of the people in fiat money, we have to do the right thing, over and over, for long periods of time. We are now standing on about 3 years of sound money. This is not a time to rock this boat. Every year that goes by, with monetary stability, we get a deepening of the trust. We should hang in there, and we will gradually reap the gains.

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Reflections on RCEP and FTAs

AMITA BATRA

India has decided not to join the 16-member Regional Comprehensive Economic Partnership because of concerns regarding sensitive sectors, the liberalisation of the services sector, mode 4 relating to movements of professionals, in particular, and the large trade deficit with China as well as with countries of the Association of Southeast Asian Nations (Asean). We are now thinking of negotiating free-trade agreements (FTAs) with other countries as well as undertaking a review of the India-Asean FTA. At this point it may be useful to reflect on some aspects of FTAs, in general, and the Regional Comprehensive Economic Partnership (RCEP), in particular.

First and foremost, it needs to be accepted that mega regional trade agreements are inevitable in Asia. These agreements are used by like-minded countries to align common interests and evolve rules and disciplines to facilitate multiple crossings of intermediate and final goods, which is essential to global value chains (GVCs) activity. The RCEP is one such mega regional trade agreement and entry into it would have been the means for India to participate in regional and global value chains. East Asia has been the most dynamic hub of GVC activity after the global financial crisis and, in fact, GVC activity for both Europe and North America with the Asian GVC hub has also increased in this period.

Secondly, trade agreements work on the principle of reciprocity. While it is true that preferential access to the participating countries is inherent and basic to an FTA, this holds true for all member countries. If we give some preferences, we also get some preferences. While existing (static) comparative advantage is the basis of an FTA negotiation for preferential access, we must also provide for dynamic comparative advantage. As we participate in GVCs, the scope for developing comparative advantage in smaller intermediate tasks (as against products) increases. So, newer comparative advantages in manufacturing and accompanying service tasks may develop and evolve in the process. It is essential, therefore, that FTA negotiations be based on dynamic comparative advantage estimations rather than solely on static considerations.

In the process of evolving comparative advantage, some sectors will lose out. This, however, is not typical of FTAs but of all trade. Trade liberalisation and, in particular, preferential liberalisation under FTAs need to be accompanied by policies and programmes to assist labour in adjusting to trade-induced displacement in the losing sectors. Countries like Japan, South Korea, and Vietnam have implemented specific trade assistance programmes such as retraining, relocation allowance, education, and financial assistance as well as support to small and medium enterprises and their workers to cope with the consequences of FTAs, trade, and economic reforms.

Thirdly, as regards trade deficit, it may be worthwhile to consider that in an age of GVCs, simple export-import calculations that do not account for third-country participation in producing goods may not be the most efficient estimates of bilateral trade deficits. Given that China is both an assembly and re-export base for many countries, a trade balance estimation based on value added may be a useful exercise that we could undertake to get a more accurate picture of our trade imbalance with the country. Also, increase in exports and trade re-balancing, while desirable objectives, are not ex ante assured outcomes. Enhanced competitiveness of domestic industry, major factor market reforms, and establishing a conducive trade and investment climate are necessary for India to take advantage of FTAs. Smaller countries like Vietnam have sought membership in a higher grade Comprehensive and Progressive Agreement for Trans-Pacific Partnership, aimed at far deeper integration relative to the RCEP, with the motivation of locking-in domestic economic reforms.

Fourthly, it may be useful for India to think beyond mode 4 liberalisation in services sector negotiations. Asean's limited internal services sector liberalisation and the fact that the India-Asean FTA in services has not yet been implemented should have been sufficiently indicative, a priori, of the difficulty in getting Asean on board. Services that accompany or are necessary to value-chain production such as business, financial, transport and logistics, or even high-end services like research and design may provide us with newer opportunities after entry into the RCEP. Identifying our potential comparative advantage in these areas will, therefore, equip us with some flexibilities in the negotiation process.

Fifthly, a low utilisation rate, as is true of India's FTA with Asean, is not necessarily indicative of FTA ineffectiveness or its limited potential to impact trade. It could also be on account of limited understanding of the FTA by business people. In addition to preferential margins and rules of origin, government initiatives and supporting consultations for industry, particularly SMEs, have helped raise FTA utilisation rates in countries like South Korea, which, like India, has been a latecomer to the FTA process. Doubts of trade creating and enhancing benefits of FTAs have been countered by government support mechanisms that include educational courses for companies, information dissemination through FTA portals, workshops, facilities for daily consultations, etc.

Sixthly, FTAs with the US and the EU are not substitutes for the RCEP as currently these are not the most dynamic regions in terms of growth or GVC activity. Trade negotiations by the US with other countries have followed the most unpredictable trajectory under the Trump presidency. In India's case, FTA negotiations have yet to begin. With the EU, FTA negotiations started in 2007. Over 12 years and many rounds, the FTA has not been finalised and issues that have been hardest to resolve are, as in the case of the RCEP, liberalisation of agriculture, services mode 4, dairy sector, and intellectual property rights, among others.

Lastly, and perhaps most importantly, foregoing the opportunity to participate in the Asean-centric RCEP may make the case for establishing our relevance in the Asean-centric strategic construct of the Indo-Pacific that much more difficult.

So, some rethink on joining the RCEP and using the next couple of months to work on a multi-pronged strategy with the help of trade experts and implementation of economic reforms is the need of the hour.

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How to beat the market

BOOK REVIEW

JOE NOCERA

There are few books in the investing world as well known as Burton Malkiel's *A Random Walk Down Wall Street*. First published in 1973, it has never been out of print, and is now in its 12th edition. Its thesis is that "a blindfolded monkey throwing darts at a newspaper's financial pages could select a portfolio that would do just as well as one carefully selected by the experts."

To put it another way, the market is so efficient that even professional investors have little chance of beating it on a regular basis. If there's one reason index funds, which replicate the performance of market indexes like the S&P 500, now hold $4.3 trillion (yes, trillion) in assets, it's that millions of investors have come to realise that the "efficient market hypothesis" Malkiel popularised is essentially correct. Emphasis on "essentially."

Jim Simons is not a blindfolded monkey. A former code-breaker for the United States government and a brilliant mathematician, he founded the most successful investment firm the world has ever seen. As Gregory Zuckerman notes in *The Man Who Solved the Market*, even Warren Buffett's track record — 20.5 per cent annualised returns since 1965 — doesn't approach Simons's average of 39 per cent gains over a three-decade span. And that's *after* his company has taken a 5 per cent management fee and 44 per cent of the profits.

The question has always been: How does Simons do it? We know that his firm, Renaissance Technologies, helped pioneer quantitative investing, relying on complex computer programs rather than human judgment, to make trading decisions. But we don't know much else. The 81-year-old Simons can be engaging in person, with a wry sense of humour (he may also be the last man in America who still smokes in his office). But on the subject of his investing success, he is secretive to the point of paranoia. Employees sign ironclad nondisclosure agreements, and are told to avoid media appearances and industry conferences.

Zuckerman, a writer for *The Wall Street Journal*, says he became fixated with cracking the Simons code. And though he doesn't entirely succeed, he divulges much more than anyone has before. More important, despite the tendency to dot his book with such daunting phrases as "combinatorial game theory" and "stochastic equations," he tells a surprisingly captivating story. It turns out that a firm like Renaissance, filled with nerdy academics trying to solve the market's secrets, is way more interesting than your typical greed-is-good hedge fund.

Simons first began investing as a young man after receiving $5,000 as a wedding gift. He was a commodities speculator for a short time; watching soybean futures soar "was kind of a rush," he told Zuckerman. But within a few years, he and several colleagues were thinking seriously about how they might create a computerised stock trading system that could search "for a small number of 'macroscopic variables' capable of predicting the market's short-term behavior." In 1978, Simons left Stony Brook University, where he had built its math department into one of the best in the country, to start up what we now know as Renaissance Technologies.

The story Zuckerman tells is about how Simons and the mathematicians and programmers he surrounded himself with found those variables. They collected incredible amounts of historical data — not just about stocks and bonds, but about currencies, commodities, weather patterns and all sorts of market-moving events. They made plenty of missteps along the way. But in time, they had gathered so much data — and had computers powerful enough to ingest that data — that the machines found profitable correlations no human could ever suss out, much less understand.

Zuckerman does a fine job of bringing not just Simons to life but most of the other "quants" who played key roles in creating Renaissance's system. For the politically inclined, one of the most interesting was the firm's former co-chief executive, Robert Mercer, the conservative billionaire who funded Breitbart News and Cambridge Analytica. Zuckerman portrays Mercer as "a peculiar but largely benign figure within the company" who liked to zing his liberal colleagues, but mostly kept his own counsel. When his role in conservative politics caused an outcry, Simons felt he had to ask his longtime partner to step down as co-CEO.

When you get right down to it, Simons makes money because human behaviour will never be completely "efficient." Those short-term anomalies Simons — and other quants — unearth exist because humans have always acted emotionally. Those little inefficiencies are what emotionless computers take advantage of. Renaissance just happens to be better at finding them than any other firm.

You can certainly argue, as one former Renaissance executive does, that hedge funds are "a game in which rich people play around with each other, and it doesn't do the world much good." You could also argue, as another former executive guiltily put it, that working for Renaissance "helped provide Mercer with the resources to put Trump in office."

But since this is a book about investing, I'll leave you with one of Zuckerman's final thoughts: "For all the unique data, computer firepower, special talent and trading and risk-management expertise Renaissance has gathered, the firm only profits on barely more than 50 percent of its trades, a sign of how challenging it is to try to beat the market — and how foolish it is for most investors to try."

In other words, stick to index funds.

THE MAN WHO SOLVED THE MARKET
Gregory Zuckerman
Portfolio/Penguin
359 pages; $30