

TRENDS REINFORCED

Perspective from
Franklin Templeton
Emerging Markets Equity



SMALL BUT MIGHTY: EMERGING MARKET TRENDS ON THE CUTTING EDGE OF CHANGE

November 2020

COVID-19 SHIFTS EMERGING MARKET TRENDS INTO OVERDRIVE

Global equity markets remain enamored with technology giants despite seismic disruptions from the coronavirus. So far this year, market valuations for some industry titans have soared, albeit with some recent volatility. The same holds for a select few of Asia's e-commerce and tech giants.

Since COVID-19 has emerged, the pace of digitization has noticeably increased, with more consumers shifting consumption from brick-and-mortar shops to online. We continue to see emerging market firms cultivate innovative environments, particularly those with small market capitalizations (caps).

EMERGING MARKET FIRMS SPARK INNOVATION

The global pandemic has now fast-tracked some emerging trends. We believe smaller companies are situated at the cusp of transformative investment themes with some strong tailwinds. Despite recently lagging businesses with a larger market cap, we think the current environment is fertile ground for small-cap opportunities, particularly in companies tightly aligned with macro trends.

We've observed two accelerating trends:

- **Biometric wearable technology.** This trend lies at the intersection of wearable technology and early COVID-19 detection. The pandemic has spurred people to become more aware of their overall health, driving the demand for wearable monitors that measure respiratory rates or even heart-rate function via electrocardiogram (ECG). While fitness bands and smartwatches share some basic smartphone features, they are still categorized separately. That said, the lines are becoming increasingly blurred between everyday wearables and specific medical devices.



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A prominent Chinese cloud-based healthcare services provider released its second-generation wearable artificial intelligence (AI) chip which places sophisticated algorithms directly on the wrist or inside the ear. The next-generation chip can detect atrial defibrillation, an irregular heart rhythm, seven times faster than the previous model, and 26 times quicker than similar algorithms.

- **Consumer premiumization.** As COVID-19 has scrambled how white-collar professionals commute to work, we examine how permanent infrastructure changes in many large European cities are making electric ‘e-bikes’ a key strategy to combatting climate change.

E-bikes, which have battery-run motors to assist pedaling, are generally cheaper to run than an automobile and at times outpace public transport. While e-bikes are generally cheaper to run than cars, they are typically three times the price of traditional bikes and thus we think merit a position in the consumer premiumization theme. Mid- to higher-end designs include ultra-light frames, custom motor options controlled through a smartphone app, and regenerative braking, a system that recoups wasted energy while stopping.

We see some truly innovative developments in emerging markets small-cap companies, some which we consider have greater long-term potential compared with larger peers. Smaller companies are generally primed to take advantage of changing trends and events as they tend to be more agile, which strengthens our investment case. While COVID-19 has reinforced our positive outlook for e-commerce giants, it has also accelerated some tailwinds supporting smaller companies.

TECHNOLOGY TACKLES THE GLOBAL PANDEMIC

As scientists sprint to test-drive new COVID-19 treatments and vaccines, some predictive COVID-19 studies at Stanford University¹ in the United States and Seoul National University² in South Korea indicate that elevated heart rates measured by wearable devices may potentially detect infection by a virus early enough to curb unchecked outbreaks.

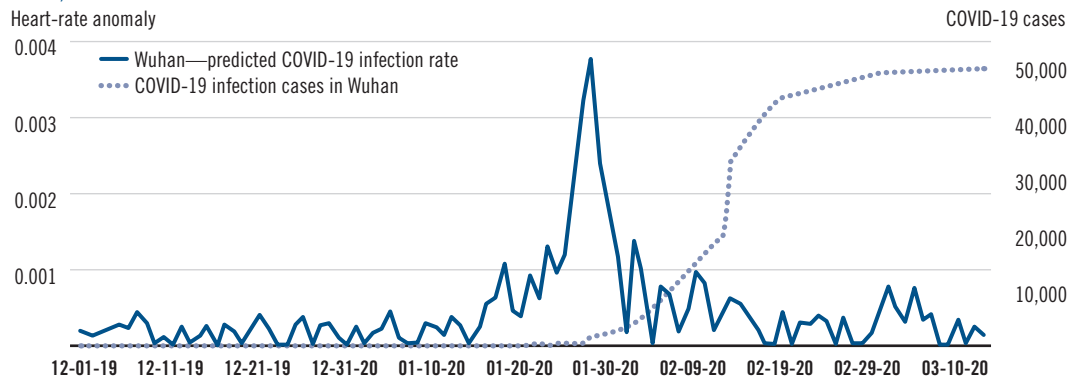
In the United Kingdom, some doctors are turning to biometric wearables to monitor COVID-19 patients during recovery. The National Health Service (NHS) announced in June it would trial new wearable technology that tracks blood oxygen levels of COVID-19 patients recuperating at home.³ NHS clinicians are able to monitor vital signs including temperature, heart rate and blood-oxygen saturation all in real time, and receive alerts if a patient is deteriorating.

In China, a world leader in smart wearable technology has conducted one of the largest COVID-19 wearables studies to date, using a historical database of 1.3 million wearable users across China and Europe. After it analyzed a group of 115,000 wearable users living in and around Wuhan, the epicenter of the COVID-19 outbreak, it detected an anomalous wave of nighttime heart-rate spikes that peaked eleven days prior to officially diagnosed COVID-19 infections in Wuhan—as shown in Exhibit 1⁴ on the next page. Further analysis revealed similar heart-rate waves in cities like Hefei, and in hard-hit European countries like Spain and Italy.

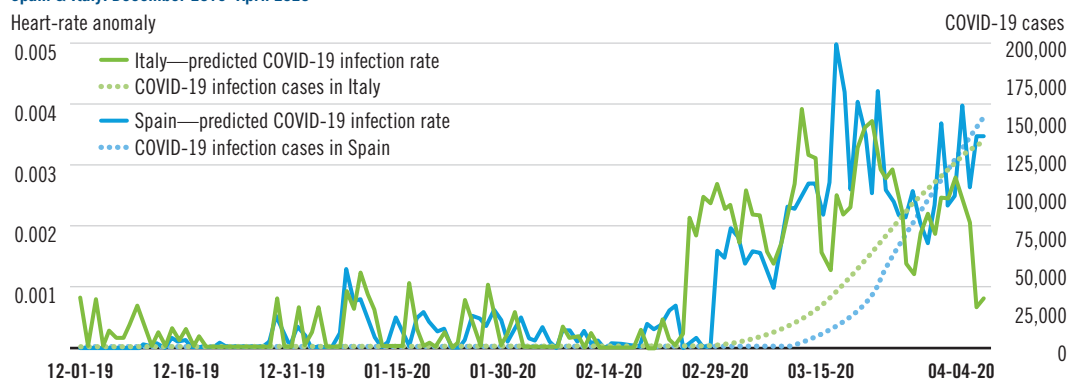
WEARABLE DATA PREDICT COVID-19 INFECTIONS

Exhibit 1: Nighttime heart-rate spikes precede COVID-19 infections

Wuhan, China: December 2019–March 2020



Spain & Italy: December 2019–April 2020



Source: Zhu, G. Li, J. Meng, Z. Yu, Y. Li, Y. Tang, X. Dong, Y. Sun, G. Zhou, R. Wang, H. Wang, K. Huang, W. "Learning from Large-Scale Wearable Device Data for Predicting Epidemics Trend of COVID-19" *Hindawi*, May 2020.

The study showed similar outcomes to COVID-19 research in the United States and South Korea, each indicating biometric wearables could save lives by predicting COVID-19 infections.

As for patients recovering from COVID-19, makers of wearables have offered their technology to partner up with research universities to track patient blood-oxygen levels. Over the long term, the research aims to develop an epidemic prediction and alert system, based on affordable, wearable AI technologies to combat future outbreaks. With joint research projects now dotted across the globe, we think the surge of interest in biometric wearables from insurers and healthcare providers has a lot of room to grow, even after the COVID-19 crisis subsides.⁵

HOMEGROWN TECHNOLOGY NO LONGER FOLLOWS THE BLUEPRINT

For decades, China's tech sector was considered by some investors to be a clone factory, copying other countries' innovations, then taking market share with noticeably lower pricing. This approach initially benefitted some everyday Chinese names, helped by a low-price strategy. However, what's notable to us about the future trajectory is that these companies no longer follow someone else's blueprint.

The first biometric wearable containing an "edge AI chip" i.e., microprocessors embedded with machine-learning algorithms, was based on open-source RISC-V chip architecture, launched by scientists at the University of California, Berkeley, in 2010. They wanted a set

of architectural instructions that wouldn't require paying costly royalties or filling out time-consuming contracts with an American chip giant, or any other international competitors. To democratize their research, the Berkeley scientists published their RISC-V architecture online, making it open to all. For a Chinese company, the RISC-V architecture would not be subject to American export controls and was relatively cheap.

In doing so, this is a noticeably different path than what the rest of the world is used to. A smartwatch could unlock your front door, control smart home appliances, translate foreign languages, and pay for in-store purchases—but so can existing apps on smartphones. By focusing on the lucrative healthcare industry with biometric wearables that can run 24/7 without needing constant recharging, some firms may be executing a shrewd wearables strategy at the right time.

THE BIKE BOOM'S GONE ELECTRIC

COVID-19 has disrupted the ways millions of us work and travel. In China, for example, air travel is still muted, and commuters remain somewhat cautious about using public transportation; road traffic, on the other hand, is mostly back-to-normal.⁶ The pandemic is also accelerating a boom in e-bike purchases, most notably in Europe's crowded urban centers.

In Paris, Mayor Anne Hidalgo has installed a system of "corona cycleways" to help get the city's workforce and economy moving safely again.⁷ While some pop-up cycle paths are temporary, like London's Streetspace network, city governments from Milan to Berlin are now fast-tracking permanent infrastructure projects that favor cyclists and pedestrians, shifting away from cars, traffic jams and carbon emissions.⁸

New sales of e-bikes—which use battery-run motors to assist pedaling—are now expected to climb by 130 million between 2020 and 2023.⁹ To put this number in perspective relative to electric cars, just 7.2 million electric automobiles were in circulation globally in 2019—47% of which were in China.¹⁰ As COVID-19 reconfigures commuting paradigms across Europe and beyond, some e-bicycle manufacturers aim to capture the recent e-bike momentum with advanced engineering and high-end bike design.

The Appeal of E-Bikes

By 2023, the total number of e-bikes in circulation globally could reach around 300 million according to Deloitte research; that's a 50 percent increase over 2019's 200 million e-bikes.¹¹ This exponential growth begs two questions: how do e-bikes work and what's their overall appeal?

At their core, e-bikes help people get from point A to B by amplifying a rider's pedal strokes with a battery-powered motor. Simply put, bicycling becomes less of a physical effort: you don't need to be an athlete to travel by e-bike. By measuring a rider's pedaling output from a torque sensor (see Exhibit 2 on the next page) an e-bike's software system, called the controller, delivers a steady flow of extra propulsion that feels natural—i.e. riders don't feel uneven power surges while pedaling.

Some e-bikes come with a throttle on the handlebars that offers power-on-demand, either for a speedy moped-style ride without pedaling, or an extra boost to pedal up hills or steep mountains on e-mountain bikes. A digital readout displays the e-bike's speed and remaining power (in higher-end models, it's often a lithium-ion battery) while smartphone apps can lock the bike, track its location through GPS, or adjust power usage to extend battery life for longer trips. Commuters may arrive at work without breaking a sweat from riding an e-bike, while still enjoying a range of health benefits. Perhaps the biggest benefit for e-biking families (and last-mile delivery services) is cost savings. All of this is music to the ears of city mayors who are grappling with frequent traffic jams and rising car emissions.

HOW DO E-BIKES WORK?

Exhibit 2: Six components drive most e-bikes

Electric battery

High-end e-bikes typically come with lithium-ion batteries, the basic battery technology used in Tesla cars.

Motor

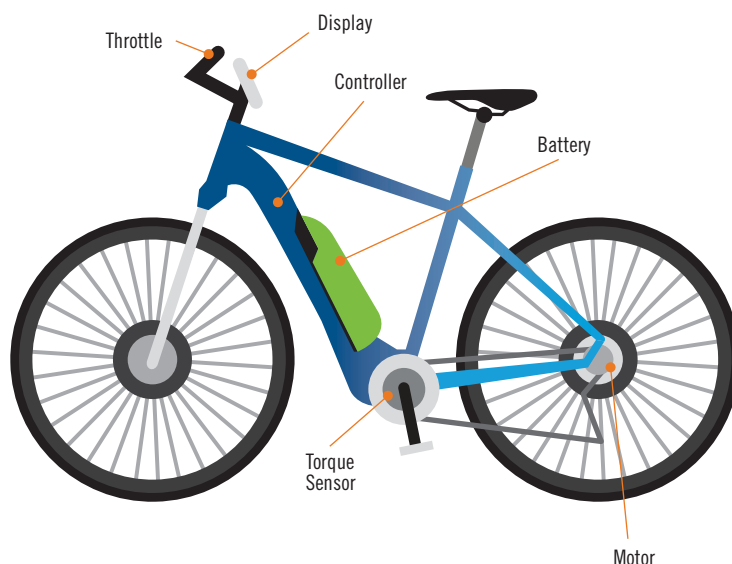
E-bike motors translate electrical energy into mechanical energy, either regulated by a **Torque Sensor** near the pedals and/or a **Throttle** on the handle bars.

Controller

Software in the e-bike controller doses power flow from the battery to the motor, in union with the torque sensor or throttle.

LCD display

A digital read out shows bike speed and remaining battery power, allowing users to adjust power usage to extend battery life on longer trips.



PREMIUM ENGINEERING COMES WITH PRICE TAGS

A typical mid-range commuter e-bike in Europe would start around €1,300. By comparison, an e-bike produced in China would start at just €337.24, though the demand there is more likely for low-end e-bikes. Overall, China produces roughly 30 million e-bikes annually.

When it comes to e-bikes and profitability, China may lead in volume of e-bikes, but it's Europe that delivers the highest revenues, given the region's strong demand for high-end e-bikes from commuters, road cyclists and mountain bike enthusiasts.

Germans are particularly fond of e-bikes—they bought 1.36 million e-bikes in 2019 versus 3.6 million cars—and, just like their automobiles, pay top dollar for state-of-the-art design and performance.¹²

To remain at the forefront of bike design and hefty European price tags, one European e-bike manufacturer located its research and development center in the German city Magstadt, near Stuttgart. Here the company experiments with new bike designs and test models before ideas hit the production plant in Taiwan. The company has so much faith in its meticulous assembly methods, it offers customers a lifetime frame warranty for every bike.

THE PANDEMIC RESHAPES URBAN LIVING

Once vaccines and/or herd immunity have eventually vanquished COVID-19, we question whether e-bikes will continue to push aside cars on urban streets. Some e-bike skeptics think the pop-up COVID cycleways will simply disappear once life gets back to normal. We see a different picture.

In some ways, COVID-19 has opened new paradigms by revealing some work and living habits as fundamentally broken. Last year, most of us thought our daily commute to far-off office parks or city towers was a dreary fact of life. For millions of white-collar professionals, the prospect of working remotely, or commuting at staggered times, is now a viable long-term option.

For many city mayors, COVID-19 has accelerated a new vision of urbanism where residents live in “15-minute cities.” Work, medical facilities, shopping and cultural life can all be within a resident’s 15-minute radius, either by foot, bike or public transport. With new infrastructure supporting large volumes of pedestrians and cyclists, cities like London and Beijing could transform into cycling capitals like today’s Copenhagen.

Many city mayors are leveraging the shock of COVID-19 to shift transportation policies and infrastructure spending to focus on a sustainable future. If that’s the case, luxury e-bike makers may be poised to capture market share as new waves of commuters switch to e-bikes.

As we’ve discussed, some truly big innovations are coming from companies with small market capitalizations. Recent market volatility tells us the laws of gravity still apply to tech titans. However, this could be the start of a new market regime. In the meantime, it bears remembering that just as COVID-19 has ushered in a positive outlook for e-commerce giants and has also accelerated tailwinds supporting companies with smaller market caps, including ones specializing in biometric wearables and e-bikes.



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