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# *Propensity to fly in emerging economies: Implications for infrastructure investment*

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## ***Executive summary***

In markets around the world, changes in propensity to fly affect demand for air travel. And when future demand increases, so does the need for investment in aviation infrastructure. Many investors focus their analyses on developed markets and, more recently, the BRIC countries—Brazil, Russia, India and China—when crafting their infrastructure investment strategies. When it comes to emerging markets, the BRICs do call for close consideration. But there are forces at work in several other emerging markets that could present equally attractive opportunities.

Investors who focus their emerging market investment strategies solely on the BRICs risk passing up interesting prospects in other economies. Identifying investment opportunities with strong growth prospects requires an understanding of trends in the forces affecting revenue growth—which are driven primarily

by passenger growth and therefore propensity to fly. In this article, we aim to build that understanding. Using forecasting and modelling and drawing on our industry and sector knowledge, we analyse how propensity to fly may shift in various emerging markets in the coming decades—and where the most promising investment opportunities may lie in the future. Hint: The best opportunities may not be where investors expect them to be.

## ***What influences propensity to fly?***

In any given market, propensity to fly (number of air trips per capita) strongly determines future demand for air travel among business and leisure travellers. The faster the future demand growth, the more urgent the need for safe and efficient airports, reliable transportation and communication networks around airports, and other forms of aviation infrastructure. And the more urgent

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**The best opportunities may not be where investors expect them to be.**

## Factors affecting propensity to fly

- **Economic health.** Propensity to fly goes up when people have enough personal income to afford vacations and when growth in the overall economy reflects growth in business and therefore the need for business trips. Having enough money for travel requires a strong economy reflected in healthy growth in gross domestic product (GDP).
- **Demographic changes.** A growing population can increase propensity to fly merely by raising the number of people living within a particular economy. An expanding middle class can boost propensity as well, as more and more people have the incomes needed to afford air travel.
- **Market maturity.** As with demographic changes, propensity to fly doesn't increase indefinitely as an economy grows.<sup>1</sup> In fact, it tapers off as a market matures and approaches saturation.
- **Crises.** Unexpected crises, such as the 9/11 terrorist attacks and the global financial crisis in Europe, can temporarily decrease propensity to fly. Following the crisis, propensity can revive strongly in a kind of catching-up pattern after several years of suppressed growth.
- **Geographical features.** Propensity to fly is greater within island nations, countries that are relatively isolated with limited land transport and large distances between population centres, and countries with a long, thin shape, which makes even high-speed rail a challenging option for travel.
- **Competition.** The rise of a new business model in a market—such as low-cost carriers (LCCs)—can increase propensity to fly if it makes air travel more affordable or appealing for consumers and businesspeople.
- **Airport hub status.** Countries with air connectivity far out of proportion to their size, because of their airports' hub status, have a higher propensity to fly owing to the availability of air services. Singapore and the United Arab Emirates are good examples of this.
- **Large immigrant worker populations.** Countries with a high proportion of immigrant workers are likely to have a higher propensity to fly relative to income, given a large number of visiting friends and relatives (VFR) trips. The United Arab Emirates is also an example of this.

<sup>1</sup> There's still a limit to how many trips a person can reasonably take in a year, given work and personal commitments. So demographic changes can't raise propensity to fly indefinitely.

the infrastructure need, the more opportunities investors have. So understanding how propensity to fly might change in various markets can help investors anticipate where the best opportunities may arise in the future.

But propensity to fly is affected by a lot of different, interrelated forces. (See the Sidebar above.) An economy's health (and therefore its personal income levels), demographic changes and the affordability of air travel are just a few examples. To identify the most promising opportunities for aviation infrastructure investing, investors must understand how those forces are changing within particular markets and compare their findings across markets. Many investors are

already basing their investment strategies at least in part on their analysis of the aviation markets of the BRIC countries: Brazil, Russia, India and China. But as we'll see, that same configuration of markets may not necessarily present the best opportunities in the future.

With that in mind, let's take a look at the forces affecting propensity to fly. We'll then compare how the most powerful of these forces are changing in several markets. And we'll consider what our analysis suggests about investment opportunities.

### **Our analysis**

We analysed trends in aviation markets around the globe, with an eye toward determining where the best investment opportunities might arise in the near and long term. Our analysis focused

on two factors: compound annual growth rates (CAGR) and correlations between per-capita GDP and number of air trips per capita, taking into account the various factors discussed above.

### **Growth in number of air passengers**

When it comes to growth in number of air passengers, our analysis of the developed world presented no surprises. Propensity to fly has been increasing rapidly in Europe, owing to deregulation of the airline industry and therefore increased competition and the consumer benefits that have ensued. But it will probably slow in the medium to long term, after the effects of deregulation have worn off and the market has reached a point of saturation. The US has already experienced this pattern.

<sup>2</sup> As defined by the International Monetary Fund.

<sup>3</sup> IATA 2005–10.

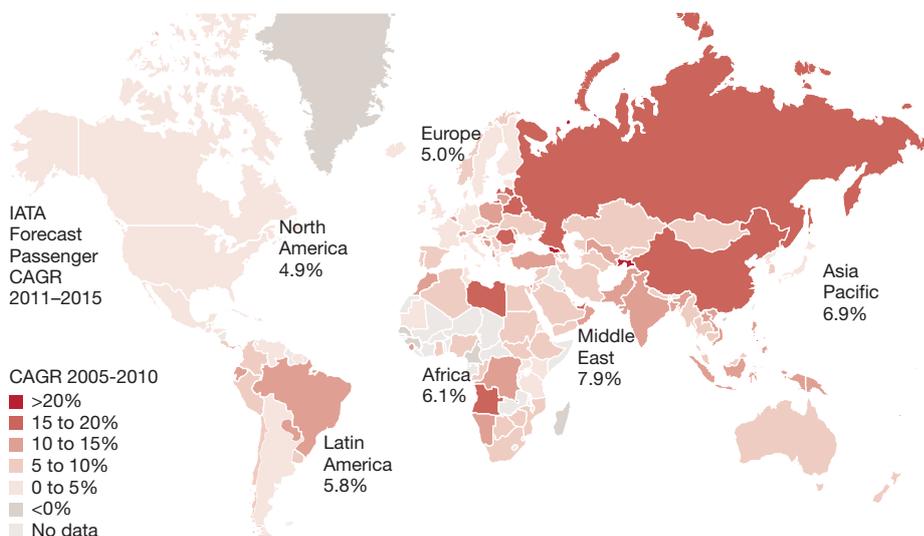
It's the rapidly developing markets—particularly newly industrialised economies like Brazil, China, India, Indonesia, the Philippines and Turkey—that are seeing the biggest jumps in the number of air passengers. (See Figure 1.) These countries enjoyed CAGRs of 11 to 16 percent between 2005 and 2010.

### Correlations between per-capita GDP and number of air trips

In addition to analysing growth in the number of air passengers, we looked at the relationship between per-capita GDP and number of air trips. But we qualified this analysis in several ways. For instance, we based our calculations on the number of one-way passengers with the point of sale in a particular country.<sup>4</sup> This approach takes out the impact of disparity between inbound and outbound passengers. Countries with a lot of inbound tourism and a low local resident population show a much higher number of trips per capita, driven by the economies of the inbound countries. So to keep things simple, we considered only resident travel patterns in our analysis.

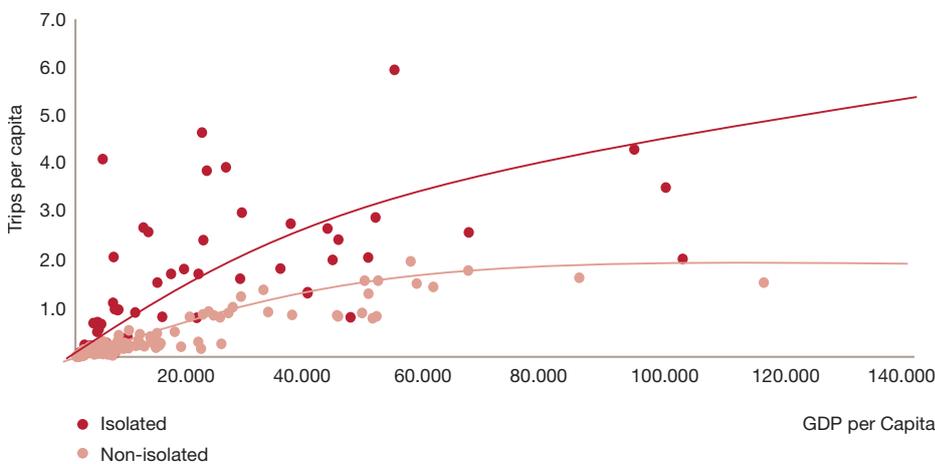
For nearly 200 countries, we plotted per-capita GDP against per-capita number of trips. Collectively, the countries we analysed account for 97 percent of passenger trips captured in Sabre's airport data intelligence database.<sup>5</sup> Drawing on the data, we developed a relationship between propensity to fly and per-capita GDP. We took into account market saturation, assuming 2–2.5 trips

**Figure 1: Historical and forecasted growth in air passengers (total international and domestic)**



Source: IATA Airline Industry Forecast 2011

**Figure 2: Relationship between air trips per capita and GDP per capita, 2011**



Source: Sabre Airport Data Intelligence, Global Insight, PwC analysis

per capita for non-isolated markets (countries where alternative transport modes are available) and more than twice that for isolated markets (for example, small island nations, countries where other travel modes are not available or competitive, or countries with major air hubs creating an inflated air travel market due to connectivity). Figure 2 shows that as GDP increases, propensity

to fly increases. It also suggests that propensity to fly reaches saturation as GDP rises.

### Resident trips per country

We used the relationships derived for isolated and non-isolated markets from the data in Figure 2 to forecast growth in resident trips for the next 30 years for each country in our study, given growth in per-capita GDP and

4 We excluded countries for which economic data was unavailable as well as nations that have low levels of outbound travel because of political or social restrictions. Likewise, we didn't include countries that have a disproportionate share of outbound passengers and that have incomplete point-of-sale or point-of-origin data.

5 Though air fares and exchange rates also contribute to the number of trips a person takes, it wasn't feasible to gather this level of detail for each country. For this reason, our analysis doesn't reflect these fares and rates.

population over the coming three decades.<sup>6</sup> We then compared these forecasts to resident trips for each country in 2011 and considered how the top 20 rankings might change in the next 30 years. (See Table 1.)

### Potential investment hot spots: Our interpretation

The upshot of our analysis is that the ranking within the top 20 countries by air trips will change over the coming three decades. Our findings suggest that Indonesia, Saudi Arabia, the Philippines, Russia and India will move up most in the ranks in terms of resident air trips. Brazil will overtake Japan and the UK and become the fourth-largest air travel market, and China will overtake the US as the largest. In the following paragraphs, we discuss a selection of markets that present varying levels of opportunity.

#### China

To capitalise on forecasted growth, the Chinese government is making significant investments to upgrade aviation infrastructure. For instance, mainland China currently has 175 commercial airports. According to the China Civil Airport Outline, this market will boast as many as 244 commercial airports in operation by 2020. Thirteen of these airports will have an annual capacity of more than 30 million passengers per annum (MPPA); six of them, 20 to 30 MPPA; and 10 of them, 10 to 20 MPPA. What's more, China plans to expand more than 100 of its existing airports, including upgrading military and general aviation airports for commercial use.

#### Indonesia

The operator of Indonesia's Soekarno-Hatta International Airport in Jakarta, the nation's capital, is committing the equivalent of US\$1.24 billion to bring the airport up to date and on

**Table 1: Resident trips, 2011 versus 2042**

Ranking	Country (2011)	Resident trips <sup>7</sup> (m) (2011)	Country (2042)	Resident trips (m) (2042)	Ranking change
1	United States	493	China	993	1
2	China	231	United States	866	-1
3	Japan	104	India	461	5
4	United Kingdom	83	Brazil	320	1
5	Brazil	73	Indonesia	198	8
6	Germany	71	United Kingdom	152	-2
7	Spain	66	Australia	131	2
8	India	66	Japan	118	-5
9	Australia	58	Russia	112	6
10	Canada	54	Spain	109	-3
11	France	53	Saudi Arabia	101	8
12	Italy	53	Germany	95	-6
13	Indonesia	44	Canada	92	-3
14	South Korea	42	Philippines	84	6
15	Russia	39	South Korea	83	-1
16	Malaysia	27	France	82	-5
17	Mexico	26	Malaysia	80	-1
18	Turkey	25	Italy	76	-6
19	Saudi Arabia	25	Turkey	76	-1
20	Philippines	22	Mexico	73	-3

*Note: These figures represent unconstrained (for example, capacity and regulation) forecasts based on 30-year forecasted GDP and population projections from Global Insight. These figures represent indicative air-traffic growth figures based on assumptions and analysis outlined in this paper. Because events and circumstances frequently do not occur as expected, there may be material differences between forecasted outcomes and actual outcomes and no reliance should be placed on these forecasts.*

*Source: Sabre Airport Data Intelligence, Global Insight, PwC analysis*

par with other major global airports. Soekarno-Hatta was built in 1985. In 2011, it was the world's 12th busiest airport. It's become so overcrowded that it experiences major flight delays at peak travel times, and passengers can expect to wait as long as an hour to claim their luggage after touching down at the airport. The area around the airport has even more problems, including telecommunications difficulties and blackouts.<sup>8</sup> The airport upgrade will be carried out in phases and calls for a new terminal and an extra runway to be completed by 2015.

As Soekarno-Hatta is being improved, an entirely new site will be constructed in Medan, about 900 miles north of Jakarta. The New Medan International Airport (Kuala Namu) will replace the existing international airport in

<sup>6</sup> Based on real GDP per capita and population forecasts from Global Insight (September 15 2012).

<sup>7</sup> Total resident trips equals propensity to fly multiplied by population.

<sup>8</sup> An emergency back-up system was introduced after two power blackouts and a radar crash at Soekarno-Hatta in 2010.

Medan (Polonia). Airside facilities will be controlled by the Indonesian government, and landside facilities will be owned by a joint venture with PT Angkasa Pura II,<sup>9</sup> which is expected to provide \$350 million as an initial investment in return for a 30-year lease. After the lease expires, ownership will revert to PT Angkasa Pura II. The Medan site will serve as a regional hub at the same level as Singapore's Changi and Bangkok's Suvarnabhumi airports.

### **Saudi Arabia**

A consortium led by the Turkish group TAV Airports was awarded the build-operate-transfer contract for Prince Mohammad Bin Abdulaziz International Airport in Medina in October 2011, making it the first airport privatisation deal in Saudi Arabia. The agreement was made between the General Authority of Civil Aviation of Saudi Arabia (GACA) and TAV alongside partners Al Rahji and Saudi Oger. The consortium will construct a new passenger terminal by the first half of 2015, and will operate the airport for 25 years.

There is private sector involvement in Saudi Arabia's three major international airports in Riyadh, Jeddah and Dammam. Fraport Saudia Arabia Ltd (a 100 percent subsidiary of Fraport AG) is responsible for the management, operation and further development of the King Abdulaziz International Airport in Jeddah and the King Khalid International Airport in Riyadh. Changi Airports International (a 100 percent subsidiary of Changi Airports Group) manages King Fahd International Airport in Dammam.

<sup>9</sup> PT Angkasa Pura II is the state enterprise of the Indonesian Department of Transport that is responsible for the management of airports and air traffic services in Indonesia.

<sup>10</sup> Infraero is responsible for operating Brazil's main commercial airports.

## **It's the rapidly developing markets that are seeing the biggest jumps in the number of air passengers.**

### **The Philippines**

The Philippines government announced a Php 303 million (US\$7.3 million) project to construct, improve and expand airports in San Vicente, Pagadian City, Butuan City, Dipolog City, Sanga-Sanga, Tawi-Tawi, Cotabato City and Maasin. In June 2012, the Department of Transportation and Communications (DOTC) invited local and foreign firms to bid for contracts to expand and improve the passenger and airport traffic handling capacity of these eight provincial airports.

### **India**

The rapid growth in the aviation sector in India requires significant updating of outdated airport infrastructure. There are currently 454 airports and airstrips in India, 16 of them designated as international airports. The Airports Authority of India (AAI) owns and operates 97 airports. India's government allows for domestic and foreign investors to participate in the development of airport infrastructure at selected airports. Foreigners can currently invest up to 25 percent in Indian companies, with this figure set to increase to 49 percent in 2013. However, many international concession companies fear that the anticipated foreign direct investment policy changes in 2013 may not come to pass because of impending elections. The government passed a legislative amendment in 2003 allowing the private sector to enter the field of airport development and permitting 100 percent foreign direct investment for greenfield airports. A number of other airports have been

granted approval to be constructed and financed through public-private partnerships (PPPs).

Of India's 454 airports, the majority are in Tier 2 and Tier 3 cities. These airports are too small to attract foreign concessionaire interest. A long-standing debate is taking place over how these airports will be modernised (with the support of foreign investors) if traffic volumes cannot support foreign investment.

In contrast, the greenfield international airports at Bangalore and Hyderabad were constructed with financing through PPPs with significant shares of foreign investment. In fact, PPPs enabled modernisation and expansion of the Delhi and Mumbai airports through a transparent competitive bidding process. Other major airports such as Chennai and Kolkata will likely also be modernised through PPPs.

### **Brazil**

Many of Brazil's major airports are currently capacity constrained and require upgrading and expansion. Future performance of Brazil's airports is critical, particularly because of Brazil's hosting of the 2014 World Cup and the Olympics in 2016 in Rio de Janeiro. In 2011, the government of Brazil decided that private companies would be granted a concession to commercially run some of Infraero's<sup>10</sup> airports to implement upgrades to airport facilities and infrastructure. Current legislation in Brazil does not allow the sale of airport infrastructure; however, the government can grant concessions or perpetual franchises

to the private sector for airport operations. The concessions are taking the form of PPPs in which the concessionaire would own 51 percent of the shares and Infraero would own 49 percent, holding veto rights on strategic decisions in the joint ventures.

With traffic volumes expected to increase significantly in Brazil over the next 10 years, Brazilian airports will likely remain attractive to investors.

### **Turkey**

The Turkish economy has grown robustly over the last decade, and its air transport services have developed exceptionally, as both its airlines and its infrastructure have modernised successfully. Visitors to Turkey increased at an average annual rate of over 10 percent over the last decade, and the country has seen a huge increase in resident trips owing to strong economic growth. New airport infrastructure and Turkish Airlines' aggressive growth have allowed for these developments. There has been increased private sector involvement in airport development since the government enacted a law on the realisation of certain investments and services in the build-operate-transfer (BOT) model in 1994. Since then, there has been private sector involvement for development at Antalya, Istanbul-Ataturk, Izmir-Adnan Menderes, Dalaman and Milas-Bodrum airports. Turkish operator TAV holdings not only is the largest airport operator in Turkey, but also operates airports abroad. Construction companies have been invited to tender for the construction of a new, third airport in Istanbul with a view to completion of the process by the end of 2012.

### **Japan**

Air traffic growth in Japan is slowing because of Japan's aging population. The resulting decline in population, coupled with slow real growth in GDP, means that propensity to fly needs to work even harder for Japan's air travel market to continue to grow and keep up with other markets. LCCs are beginning to have a presence at Japanese airports, potentially leading to stiffer competition and lower fares, which could increase propensity to fly. Despite modest growth expectations, Japan still presents an opportunity for investors, as the Japanese government has announced plans to concession up to 27 airports between 2015 and 2019. In parallel, the state of Hokkaido has also expressed an interest in concessioning its 11 airports. Japanese airports present significant commercial opportunities, as this area has previously been underexploited.

can put up barriers to investors in markets that look good because they're anticipating huge growth in their aviation industry. For example, China will see a big jump in air traffic growth, and (as we noted above) its government is planning to invest heavily in beefing up aviation infrastructure. The government is also initiating reforms to raise income levels—including increasing the minimum wage 40 percent by 2015, expanding the government-funded social welfare and health care system, and promoting labour-intensive service industries. These moves could boost consumption as a percentage of GDP growth. All this suggests that China may represent a good opportunity for investment. But owing to regulations restricting foreign investment, the door isn't necessarily open for outside investors. By contrast, the Indian government allows foreigners to invest

## **The ranking within the top 20 countries by air trips will change over the coming three decades.**

### **Considerations for investors**

We have outlined several emerging markets that will see a major increase in their propensity to fly over the next 30 years. Each of these markets needs significant infrastructure upgrading. In making investment decisions, investors will want to take into account these markets' unique characteristics, including the regulatory environment and the changing global aviation landscape.

Let's consider the regulatory environment first. Tax and investment laws, along with other regulations,

significantly in Indian companies, and prospects look good for foreign direct investment in greenfield airport developments. Thus India's aviation infrastructure may constitute a much better opportunity, at least in the medium term.

Here's another consideration: Developed economies' aviation markets might not look like worthy investment targets because of market maturity and the influx of new competitors from the Middle East, Turkey and other emerging economies. But that's a surface-level view of the situation. Our analysis shows

## Investors will want to take into account the market's unique characteristics.

that these new competitors won't necessarily pose a threat to developed economies in terms of taking away market share. They could actually present an opportunity—for mature markets and investors alike. Why? Their presence will create more inter-airport connections and thus increase cross-border networks. Aviation infrastructure will expand as a result, opening up new opportunities for investors in developed and developing markets.

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### **Next steps**

By understanding trends in the forces affecting propensity to fly and comparing these trends across aviation markets, investors can gain critical insights into where the most promising opportunities may arise in the future. Our analysis suggests that while the US, Europe and the BRICs still merit consideration, a number of additional markets—notably in Indonesia and the Philippines—may offer equally attractive potential in the future and thus bear watching. Undoubtedly other factors—particularly restrictions on foreign investment and appetite for private-sector participation—and other market features also play an important role in decisions about which markets to focus investment. However, propensity to fly can provide some useful insights into a market's potential in the longer term.