

# Argentina: The Road to the App Economy



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## Introduction

All around the world we are seeing the rise of the App Economy—jobs, companies, and economic growth created by the production and distribution of mobile applications (“apps”) that run on smartphones. Since the introduction of the iPhone in 2007, the App Economy has grown from nothing to a powerful economic force that rivals existing industries.<sup>1</sup>

In this paper we examine the production and distribution of mobile apps as a source of growth and job creation for Argentina. We find that Argentina had roughly 33,250 App Economy jobs as of March 2016.

What’s more, Argentina has the potential to add many more App Economy jobs in the near future. With President Mauricio Macri taking office in December 2015, Argentina began the arduous process of regaining its economic stability after the country’s crippling debt disputes of the prior 15 years.

Macri has made some large strides in normalizing the economy such as lifting currency controls, removing several export taxes, and most importantly, settling the debt dispute.<sup>2</sup> By reaching an agreement with the holdout bondholders, Argentina has regained access to international financial markets, giving Argentines, as well as outsider investors, hope for Argentina’s return to economic stability.<sup>3</sup>

Even with the turmoil of the past decade and a half, Argentina has an emerging startup community, specifically in the tech sectors. It was during this time period that Internet and tech giants MercadoLibre, Despegar, Globant, and OLX were founded in Argentina.<sup>4</sup>

Going forward, Argentina has several important advantages as a hub for domestic and export app development. The country has a growing number of Internet (Figure 1) and mobile broadband (Figure 2) users and the second largest economy in South America, making its domestic market for apps quite appealing.<sup>5</sup> And it is an attractive low-cost option for offshore app development by U.S. and European

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firms, since Buenos Aires is only one hour ahead of New York City, four hours ahead of Silicon Valley, and four hours behind London. Furthermore, Argentina ranks as the most English proficient country in Latin America.<sup>6</sup>

**Figure 1: Argentina's Growing Internet User Base**

| Number of Internet Users<br>(per 100 people) |      |
|--|------|
| 2005   | 17.7 |
| 2006   | 20.9 |
| 2007   | 25.9 |
| 2008   | 28.1 |
| 2009   | 34.0 |
| 2010   | 45.0 |
| 2011   | 51.0 |
| 2012   | 55.8 |
| 2013   | 59.9 |
| 2014   | 64.7 |

*Data: World Bank<sup>7</sup>*

## Significance of the App Economy

This paper is part of our long-term effort to track the growth of the App Economy globally, and to see which countries are benefitting the most. Our goal is to produce a set of globally-consistent and credible estimates for App Economy employment by individual countries, and by broad geographical regions such as states and major cities. Ideally, we should be able to link App Economy growth to policy measures undertaken by governments.

The App Economy is less than a decade old, having only started after the introduction of the iPhone in 2007. The App Economy started in California's Silicon Valley, home to Apple and Google, but has since spread globally, helping turn New York and London into global tech hubs as well. By our definition, the App Economy is the whole ecosystem of jobs, companies, and income connected with mobile apps.

Argentina has a rapidly growing number of app developers—these are the people who design and create the apps distributed domestically and internationally. Moreover, Argentine companies that do app development also have to hire sales people, project managers, database programmers and other types of workers. Finally, each app developer, by spending money in the local economy, supports a certain number of local jobs.

Many people mistakenly think of mobile apps as simply games, but in reality, mobile games are only a small part of the App Economy. Games are important—Argentina's Trivia Crack was the number one most downloaded app in Apple's App Store for a record-breaking 66 days in 2015<sup>8</sup>—but apps are also developed

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and used by major multinationals, banks, media companies, retailers, and governments. As of July 2015, there were 1.6 million apps available for Android, and another 1.5 million available on Apple's App Store.<sup>9</sup>

Apps have become the front door to the Internet. People send messages to friends on WhatsApp, log onto the Facebook app, or their bank app, or the app of their airline. One could spend an entire day on the Internet while only using apps. And with mobile broadband connections and smartphone penetration rates increasing in Argentina, mobile Internet usage is surging as well.

**Figure 2: Argentina's Mobile Penetration Rates**

|                     | <b>Unique Mobile<br/>Subscribers</b><br>(in millions) | <b>Mobile Penetration,<br/>Unique Subscribers</b> | <b>Mobile Broadband<br/>Connections</b><br>(in millions) | <b>Smartphone<br/>Connections</b><br>(percentage of total) |
|---------------------|---|---|--|--|
| 2012                | <b>37</b>   | <b>89%</b>  | <b>12</b>  | <b>16%</b>   |
| 2013                | <b>39</b>   | <b>90%</b>  | <b>20</b>  | <b>25%</b>   |
| 2014                | <b>39</b>   | <b>90%</b>  | <b>24</b>  | <b>32%</b>   |
| 2015<br>(estimated) | <b>39</b>   | <b>90%</b>  | <b>28</b>  | <b>40%</b>   |

Data: GSMA Intelligence<sup>10</sup>

Moreover, the demand for new mobile apps is only going to skyrocket in the future. One of the biggest changes coming is the Internet of Things, which is the use of the Internet to help control physical devices and our physical environment.<sup>11</sup> Farmers will increasingly use apps to aid their agricultural production, nurses and doctors will use apps to manage patient care, and manufacturers will use apps to control their factories.<sup>12</sup>

## App Economy Examined

We noted earlier that the App Economy is not simply about games, or about small app developers. In fact, the App Economy turns out to be remarkably diverse. The conventional picture of an app developer is a single person working in a basement, or perhaps a small firm with two or three programmers.

However, as we have researched the App Economy globally over the past three years, we have found that a surprisingly broad range of enterprises are searching for workers who have the ability to develop, maintain, or support mobile applications.<sup>13</sup> Tiny app developers and large mobile broadband providers; tech companies and non-tech companies; multinationals, nonprofits, and the government—it's just amazing the types of enterprises that are hiring app developers these days.

Based on our analysis of the App Economy in Argentina, we have found these types of companies who hire App Economy workers:

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1. **Large, medium, and small Argentine app developers, who may be creating apps for themselves or for clients.** These companies are the leading edge of the App Economy. For example, online travel booking giant Despegar was advertising for a Mobile Java Developer, iOS Developer, and Android Developer in Buenos Aires as of March 2016. Vates, a software development company headquartered in Córdoba, was looking to hire a Junior Android Developer at its main office and a Senior Android Developer in Buenos Aires. And Etermax, mobile game development company and creator of Trivia Crack, was posting for multiple App Economy positions in March 2016, including a Windows Phone Developer and Game Analyst.
  2. **Global app companies who are hiring local Argentine developers.** This is potentially a very important source of jobs for Argentina. For example, Solstice Mobile, an enterprise innovation and mobility solutions firm headquartered in Chicago, was recruiting for various App Economy positions in Buenos Aires as of March 2016, such as Mobile Product Consultant, UX Designer, and Quality Assurance Analyst. And San Francisco-based Eventbrite was advertising for a Senior Android Mobile Software Engineer in Mendoza.

There are numerous examples of open positions advertised in March 2016 for companies based in Argentina that specialize in mobile development and software outsourcing with clients worldwide. In Buenos Aires, software innovation development firm Belatrix was posting for an Android Developer and an iOS Developer. In Córdoba, Agile software development company Taller Technologies was looking to hire a Software Tester, Junior Android Developer, Senior Android Developer, and iOS Developer. Intraway, a software development firm specializing in business solutions for telecom and cable companies that has headquarters both in the U.S. and Argentina, was advertising an opening for an Android Developer in Buenos Aires and a Senior Android Developer in Córdoba.

3. **Media, software, finance and retail companies that engage in app development for consumer use under their own name.** These days, mobile applications are essential for media and software companies. For example, Argentine television station Telefe, specializing in the generation of multi-platform content, was looking to hire a Coordinator of Digital Products in Buenos Aires as of March 2016. One of Argentina's leading daily newspapers, La Nación, was also recruiting employees with App Economy skills in Buenos Aires, advertising for iOS and Android Mobile Developers in March 2016.

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Moreover, apps are a natural fit for retail and finance companies. For example, Argentina's five largest banks (and various others) have mobile apps on offer that allow customers to perform some banking functions online.<sup>14</sup> In the retail sector, MercadoLibre, Argentina's leading e-commerce platform, was advertising openings for iOS and Android Developers in Buenos Aires and Mobile Developers in Mendoza as of March 2016.

4. **Other large non-tech companies that are developing apps for internal and customer use.** In every industry, businesses are realizing that apps, and mobile in general, are becoming essential tools for productivity, marketing and customer service. For example, two major Argentine grocery chains have apps available—Coto offers a digital shopping app in the iTunes App Store and Vea Censosud provides circulars and recipes through its app in the Google Play Store.
5. **Government organizations that develop apps to provide services for their citizens.** App development is not limited to the private sector. For example Argentina's Ministry of Interior and Transport produced an app to follow the results of the 2015 presidential and legislative elections. The ministry also currently offers a real-time public transportation app in both the iTunes app store and the Google Play Store. And the city government of the City of Buenos Aires is keeping up with the trend with a series of apps. They have a real-time traffic app (BA Movil), an app for their subway system (BA Subte), a local events app (BA Cultural), an app for the city's bicycle sharing program (BA EcoBici), an app for locating free wireless Internet connections in the city (BA Wifi), and many others.

As the App Economy grows in significance globally, it becomes essential to have a consistent set of App Economy job estimates.

This is only a small sample of the companies that are currently hiring App Economy workers in Argentina.

### Tracking App Jobs Globally

As the App Economy grows in significance globally, it becomes essential to have a consistent set of App Economy job estimates so that policymakers can compare their country's performance with that of other countries. For that reason, we have developed a new, standardized methodology for estimating App Economy employment.

This methodology was originally developed in 2012 to estimate the size of the United States app economy.<sup>15,16,17</sup> Since then, it has been refined and broadened to provide estimates for developed countries and regions such as Europe and Australia, and developing countries such as Vietnam and Indonesia.

The methodology uses online job postings for workers with app-related skills as a

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real-time measure of App Economy employment. We benchmark this data against official government statistics in order to eliminate many of the well-known problems connected with using big data to measure economic variables.<sup>18</sup>

Job search engines are a wonderful source of data about the current labor market in a country. Companies post their openings on their website or use job boards to place job postings and those online job postings are collected and indexed in real-time by job search engines such as Indeed (which for Argentina is located at the URL [ar.indeed.com](http://ar.indeed.com)). That is, the job seeker can input relevant criteria into the job search engine, such as skills, location, and so forth. And then the job search engine will return a list of all the current job postings that match the criteria. In Argentina, the postings may either be in English or Spanish and the methodology used accounts for this.

The main positive is that job postings (or want ads) typically contain detailed information about the skills that the employers are looking for. For instance, if a job posting requires that the job candidate have experience developing apps for iOS—the iPhone/iPad operating system—then we can reasonably conclude that the job is part of the App Economy. Similarly, if a job posting calls for experience developing apps for Android, Windows Phone/Mobile, or Blackberry, we can be reasonably sure that the job is part of the App Economy as well.

For example, leading online classifieds platform OLX was advertising for an iOS developer and an Android developer in Buenos Aires as of March 2016. Both job postings reflected App Economy jobs by requiring the skill to build mobile apps.

What’s more, the search engine results are continually updated. And especially in tech fields, the expectation is that the potential employees will search for jobs using the Internet, so companies are usually very willing to post open positions online, because that’s where they will find their workers.

On the other hand, job search engines do have certain problems. Obviously in Argentina some jobs will not be listed on online job postings, especially since many people still don’t have smartphones. Still, analyzing the results of job search engines gives us information about the tech labor market that can’t be gotten any other way.

## Measuring App Economy Employment

For this study, a worker is in the App Economy if he or she is in:

- An information and communications technology (ICT)-related job that uses App Economy skills—the ability to develop, maintain, or support mobile applications. We will call this a “core” App Economy job. Core app economy jobs include app developers; software engineers whose work requires knowledge

of mobile applications; security engineers who help keep mobile apps safe from being hacked; and help desk workers who support use of mobile apps.

- A non-ICT job (such as human resources, marketing, or sales) that supports core app economy jobs in the same enterprise. We will call this an “indirect” App Economy job.
- A job in the local economy that is supported by the income flowing to core and indirect app economy workers. These “spillover” jobs include local retail and restaurant jobs, construction jobs, and all the other necessary services.

To estimate the number of core App Economy jobs, we use a multi-step procedure based on data from the universe of online job postings. Our first observation is that online job postings typically describe the skills and knowledge being sought by the employer.

In practice, we compiled a short list of key words and phrases that would generally be associated with App Economy-related skills. These include iOS, Android, Blackberry, “Windows Phone,” “Windows Mobile,” and app. We applied these search terms to the real-time database of job postings developed by Indeed, which gave us an unadjusted count of job postings for core App Economy jobs.

However, that’s only the start. Job postings for an occupation are only a fraction of the number of people employed in that occupation, since most positions are not empty. We develop an estimate for the ratio between the number of job postings for ICT jobs and overall ICT employment. This ratio is applied to the number of app economy job postings to generate a provisional estimate of core app economy employment. Crucially, we use a validation procedure to ensure that we are only counting job postings that correspond to core app economy jobs. We use a conservative estimate of the indirect and spillover effects.<sup>19</sup>

## The Result

So how large is the Argentina App Economy today? Based on our analysis we find that Argentina had roughly 33,250 App Economy jobs as of March 2016.<sup>20</sup> That’s up from nothing as of 2007, before the iPhone was introduced.

**Figure 3: Argentina’s App Economy**

|                  | Estimated App Jobs | Percent of total |
|------------------|--------------------|------------------|
| <b>Argentina</b> | <b>33,250</b>      |                  |
| Buenos Aires     | 25,650             | 77.1%            |
| Córdoba          | 1,400              | 4.2%             |
| Other Areas      | 6,200              | 18.7%            |

*Data: Progressive Policy Institute, Indeed*

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Given our estimate of 33,250 App Economy jobs, Argentina has an app intensity rate of 0.2 percent, with app intensity defined as App Economy jobs as a percentage of all jobs.<sup>21</sup>

This may seem low when compared to the U.S. and the European Union, that have average app intensities of 1.2 percent and 0.7 percent, respectively.<sup>22</sup> However, Argentina has a nascent app ecosystem situated within an overall economy that is just starting out on a long road to recovery and stabilization.

The country has enormous potential to grow. For example, *Computer Weekly* named Argentina as the top “outsourcing destination to watch”<sup>23</sup> and the *Huffington Post* published an article in early 2015 detailing the dynamic startup ecosystem in Argentina.<sup>24</sup>

We can take the analysis a bit further by assessing the distribution of mobile operating systems in Argentina’s App Economy since many App Economy job postings note a specific mobile operating system or multiple mobile operating systems that the job candidate is expected to be familiar with.

**Figure 4: Argentina App Economy Jobs by Major Operating System**

|                                       | App Economy Jobs<br>(in thousands) | Share of Total App<br>Economy Jobs* |
|---------------------------------------|------------------------------------|-------------------------------------|
| <b>Android Ecosystem</b>              | <b>25.1</b>                        | <b>75%</b>                          |
| <b>iOS Ecosystem</b>                  | <b>22.0</b>                        | <b>66%</b>                          |
| <b>Windows Phone/Mobile Ecosystem</b> | <b>3.5</b>                         | <b>10%</b>                          |
| <b>Blackberry Ecosystem</b>           | <b>2.0</b>                         | <b>6%</b>                           |

Data: Progressive Policy Institute, Indeed

\*Percentages sum to more than 100 because the same position can participate in multiple ecosystems.

As of March 2016, we estimate that 75 percent of App Economy workers in Argentina (25,000 jobs) belong to the Android ecosystem. This figure includes Android specific jobs as well as jobs supporting both Android and other operating systems. This compares with the iOS ecosystem at 66 percent of Argentine App Economy workers (22,000 thousand jobs). This figure similarly includes iOS specific jobs as well as jobs supporting both iOS and other platforms. The Windows Phone/Windows Mobile ecosystem accounts for 10 percent, while the Blackberry ecosystem accounts for 6 percent.

The numbers sum to more than 100 percent because quite a few jobs specify more than one operating system—requiring, for example, both iOS and Android skills.

## Long-Term Potential and Obstacles

App development may offer a speedy route to economic and employment gains for a country such as Argentina that is both an appealing offshoring destination for U.S. and European companies and also a large economy with a robust internal market.

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Argentina nurturing its App Economy is a logical means to growth and stability, as it requires far less physical capital than traditional manufacturing markets.

Argentina nurturing its App Economy is a logical means to growth and stability, as it requires far less physical capital than traditional manufacturing markets. All that is required for mobile app development is a skilled workforce and good telecom connections, both domestically and internationally.

According to a 2015 report from the World Economic Forum (WEF), Argentina already has some advantages that help to support its flourishing mobile ecosystem. Individual technology usage rates are high—in mobile subscriptions, Internet use, and fixed broadband subscriptions. Additionally, Argentina has robust ICT-related infrastructure, further strengthened by the 2013 build out of a submarine cable that connects Argentina to Uruguay and Brazil.<sup>25</sup> These are vital components to have in place for a thriving App Economy.

But Argentina has some hurdles to jump as well. Argentines face exceedingly high taxation in the mobile sector. Mobile services are charged a VAT rate that is 6 percent higher than the standard VAT while mobile handsets are subject to import restrictions and high taxes as well. In Argentina, the tax on mobile devices as a percentage of the total cost is a whopping 58 percent—the second highest rate in the world.<sup>26</sup>

Other barriers to growth are the shortcomings of Argentina’s political and regulatory framework and its business and innovation environment, areas that both ranked poorly in the WEF report on network readiness.<sup>27</sup> These are also vital components for a thriving App Economy and must be improved upon in order for Argentina to realize its potential as a mobile development hub.

Fortunately, Argentina’s national government has already done some work to foster its development community. The Argentine Ministry of Education announced in August 2015 a national policy for the formal inclusion ICT skills in public education.<sup>28</sup> Students in primary school are now required to take programming classes and in secondary school students must study both programming and entrepreneurship.

The Minister of Education for the new administration, Esteban Bullrich, spent the previous five years leading the Ministry of Education for the City of Buenos Aires. During that time, many reforms were enacted to modernize the educational system, including the cultivation of innovation and entrepreneurship. Minister Bullrich asserts the importance of an entrepreneurial mindset being a part of education: “If we want education to become the innovation engine of our society, we need teachers... to be the most innovation people [of all]—because they need to train innovators.”<sup>29</sup>

And it’s not just the national government that is working to nurture the App Economy and the burgeoning startup ecosystem in Argentina. The business

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community is coming together and making advancements in the sector as well—especially in Buenos Aires.

There are a multitude of accelerators, co-working spaces, angel investors, and venture capitalists that exist there and more are cropping up regularly. A great example is Startup Buenos Aires,<sup>30</sup> “one of the city’s most influential entrepreneurial organizations,” which has helped to turn the city’s fragmented startup market into a well-functioning ecosystem that helps entrepreneurs innovate and grow their businesses.<sup>31</sup>

The Buenos Aires local government has demonstrated its support of this promising entrepreneurial ecosystem by launching a Programa Aceleradoras Buenos Aires Emprende in 2014.<sup>32</sup> In its first year, the program invested AR\$28 million (US\$3.5 million) to support entrepreneurs. AR\$18 million (US\$2.25 million) went to local accelerators for direct investment in 13 startup projects in Buenos Aires.<sup>33</sup>

The implication is that by following the right economic policies, the App Economy may help accelerate Argentina’s economic development. At the same time, excess government regulations can unnecessarily choke off App Economy growth in Argentina. The country must continue with the types of policies that facilitate App Economy growth in order to allow Argentina to participate in the global mobile revolution as producer rather than a consumer. Putting too many costly restrictions on Argentina’s App Economy will only divert the growth elsewhere.

By building upon its current strengths and directly addressing the need for improvement in its regulatory and innovation environment, a country such as Argentina can become a leader in the global App Economy, creating good jobs and value-added growth at home.

## Endnotes

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<sup>1</sup> Philip Elmer-Dewitt, “Apple’s Apps Economy: Bigger than Hollywood,” *Fortune*, January 22, 2015, <http://fortune.com/2015/01/22/apples-apps-economy-bigger-than-hollywood/>.

<sup>2</sup> The Economist, “Argentina’s Debt – At Last: A Deal with Holdout Bondholders is Expensive, But Worth It,” March 5, 2016, <http://www.economist.com/news/americas/21693786-agreement-victory-countrys-new-president-argentina-reaches-deal-its>.

<sup>3</sup> Jonathan Keane, “Argentina is Betting on Programming to Boost its Tech Sector,” *IDG Connect*, October 14, 2015, <http://www.idgconnect.com/abstract/10496/argentina-betting-programming-boost-tech-sector>.

<sup>4</sup> NXP Labs, “LatAm Unicorns,” 2016, <http://www.nxtplabs.com/latam-unicorns/>.

<sup>5</sup> The World Bank, “Data: GDP Ranking,” Updated February 17, 2016, <http://data.worldbank.org/data-catalog/GDP-ranking-table>.

<sup>6</sup> Education First, “EF English Proficiency Index 2015,” <http://www.ef.edu/epi/>.

<sup>7</sup> The World Bank, “Data: Internet Users (per 100 people),” Accessed April 11, 2016, <http://data.worldbank.org/indicator/IT.NET.USER.P2>.

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- <sup>8</sup> Sarah E. Needleman, "Can an App Be Too Successful? Ask 'Trivia Crack,'" *The Wall Street Journal*, February 20, 2015, <http://www.wsj.com/articles/can-an-app-be-too-successful-ask-trivia-crack-1424458516>.
- <sup>9</sup> Statista, "Number of Apps Available in Leading App Stores as of July 2015," <http://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/>.
- <sup>10</sup> Akanksha Sharma, Pau Castells, and Tim Hatt, "Country Overview: Argentina – Impact of the Mobile Ecosystem: Perspectives and Opportunities," GSMA Intelligence, April 6, 2016, <https://gsmaintelligence.com/research/2016/04/country-overview-argentina/554/>.
- <sup>11</sup> Michael Mandel, "Can the Internet of Everything bring back the High-Growth Economy?," *Progressive Policy Institute*, September 2013, <http://www.progressivepolicy.org/issues/economy/can-the-internet-of-everything-bring-back-the-high-growth-economy/>.
- <sup>12</sup> For example, India is pioneering the use of smartphone apps to help farmers make decisions about the use of fertilizer: Das, Usha Rani. "3 Apps That Can Revolutionize India's Agriculture Sector, Very Easily!" *Business Insider-India* June 24, 2015. <http://www.businessinsider.in/3-Apps-that-can-revolutionize-Indias-Agriculture-sector-very-easily/articleshow/47802227.cms>.
- <sup>13</sup> Michael Mandel, "Jobs in the Australian App Economy," *Progressive Policy Institute*, July 2014, [http://www.progressivepolicy.org/wp-content/uploads/2014/07/2014.07-Mandel\\_Jobs-in-the-Australian-App-Economy.pdf](http://www.progressivepolicy.org/wp-content/uploads/2014/07/2014.07-Mandel_Jobs-in-the-Australian-App-Economy.pdf).
- <sup>14</sup> Note: Bank ranking was determined by total assets as of June 2014; Largest banks are 1) Banco de la Nacion Argentina, 2) Banco Provincia, 3) Banco Galicia, 4) Banco Santander Rio, 5) Banco Macro according to: Banks around the World, "Banks in Argentina," Accessed April 12, 2016, <http://www.relbanks.com/south-america/argentina>.
- <sup>15</sup> Michael Mandel, "Where the Jobs Are: The App Economy," South Mountain Economics, February 2012, <http://southmountaineconomics.files.wordpress.com/2012/09/technet-app-economy-study.pdf>.
- <sup>16</sup> Michael Mandel and Judith Scherer, "A Low-Cost And Flexible Approach For Tracking Jobs And Economic Activity Related To Innovative Technologies," South Mountain Economics, Nesta Working Paper No. 15/11, June 2015, <http://www.nesta.org.uk/publications/low-cost-and-flexible-approach-tracking-jobs-and-economic-activity-related-innovative-technologies>.
- <sup>17</sup> Robert E. Litan, Andrew W. Wyckoff, and Kaye Husbands Fealing, "Technology, and Innovation: Improving Indicators to Inform Policy," *National Research Council*, ed. *Capturing Change in Science (National Academies Press)*, 2014, [http://www.nap.edu/catalog.php?record\\_id=18606](http://www.nap.edu/catalog.php?record_id=18606).
- <sup>18</sup> Steve Lohr, "Google Flu Trends: The Limits of Big Data," *New York Times*, March 28, 2014, <http://bits.blogs.nytimes.com/2014/03/28/google-flu-trends-the-limits-of-big-data/>.
- <sup>19</sup> We assume that each core app economy job is associated with two additional jobs (combined indirect and spillover). This assumption is low compared to the typical job multiplier found in the literature, which can go as high as 5 or even higher. For more information on job multipliers in the literature see: Rob Sentz "Job Multipliers: Silicon Valley vs. The Motor City," EMSI August 21, 2012, <http://www.economicmodeling.com/2012/08/31/job-multipliers-silicon-valley-vs-the-motor-city/>.
- <sup>20</sup> GSMA Intelligence recently published an estimate of 2015 employment in Argentina's mobile ecosystem. Their analysis was done using a different methodology and different data sources than was used in this paper and thus is not comparable with this estimate.
- <sup>21</sup> Data: Progressive Policy Institute, ILOSTAT
- <sup>22</sup> Michael Mandel, "App Economy Jobs In Europe (Part 1)," *Progressive Policy Institute*, January 21, 2016, <http://www.progressivepolicy.org/blog/app-economy-jobs-in-europe-part-1/>.
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- <sup>23</sup> Arif Mohamed, “Top Five Outsourcing Destinations to Watch,” *Computer Weekly*, December 15, 2008, <http://www.computerweekly.com/feature/Top-five-outsourcing-destinations-to-watch>.
- <sup>24</sup> Ignacio Peña, “Startups Like to Tango,” *Huffpost Business*, February, 19, 2015, [http://www.huffingtonpost.com/ignacio-peaa/startups-like-to-tango\\_b\\_6710884.html](http://www.huffingtonpost.com/ignacio-peaa/startups-like-to-tango_b_6710884.html).
- <sup>25</sup> World Economic Forum, “Global Information Technology Report 2015,” April 15, 2015, <http://reports.weforum.org/global-information-technology-report-2015/country-highlights/#argentina>.
- <sup>26</sup> Akanksha Sharma, Pau Castells, and Tim Hatt, “Country Overview: Argentina – Impact of the Mobile Ecosystem: Perspectives and Opportunities,” *GSMA Intelligence*, April 6, 2016, <https://gsmaintelligence.com/research/2016/04/country-overview-argentina/554/>.
- <sup>27</sup> World Economic Forum, “Global Information Technology Report 2015,” April 15, 2015, <http://reports.weforum.org/global-information-technology-report-2015/country-highlights/#argentina>.
- <sup>28</sup> Consejo Federal de Educación, “Resolución CFE N° 263/15”, August 12, 2015, <http://www.me.gov.ar/consejo/resoluciones/res15/263-15.pdf>.
- <sup>29</sup> Sveta Mcshane, “Argentina’s Plan to Grow a Culture of Innovation From the Classroom Up,” Singularity University, December 1, 2015, <http://singularityhub.com/2015/12/01/argentinas-plan-to-grow-a-culture-of-innovation-from-the-classroom-up/>.
- <sup>30</sup> Startup Buenos Aires (SUBA), <http://www.startupbuenosaires.com/en/>.
- <sup>31</sup> Camila Souza, “6 Damn Good Reasons to Startup in Buenos Aires,” *Tech.co*, August 29, 2014, <http://tech.co/reasons-startup-buenos-aires-2014-08>.
- <sup>32</sup> Buenos Aires Ciudad, “Programa Aceleradoras Buenos Aires Emprende,” <http://www.buenosaires.gob.ar/innovacion/emprendedores/capitacion-y-financiamiento/aceleradoras>.
- <sup>33</sup> Ariel Arrieta, “Singularity and Growth in Latin America: Nine Drivers of Category-Leading Companies,” *Kauffman Fellows Report*, vol. 6 (2015). [http://www.kauffmanfellows.org/wp-content/uploads/KFR\\_Vol6/Ariel\\_Arrieta\\_vol6.pdf](http://www.kauffmanfellows.org/wp-content/uploads/KFR_Vol6/Ariel_Arrieta_vol6.pdf).

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