Columbia|SIPA
School of International and Public Affairs

Software is Eating World Trade, But Will Fragmentation Bite Back?

May, 2017

By Usman Ahmed[i]

1. Introduction

Venture Capital Marc Andressen famously quipped in 2011, "Software is eating the world."[ii] Research that we have been conducting at PayPal demonstrates that software, and in particular Internet-enabled software, is eating every sector and segment of the global trade value chain.[iii] Internet-enabled trade has resulted in a number of positive developments: enhanced growth for overlooked sectors and segments of society, as well as small and medium sized enterprises (SMEs) that have traditionally been unable to reap the benefits of global globalization. But, this positive story is limited by several factors, one of which is the fragmentation of the Internet. Divergent national rules on technical, social, and policy issues undermine the global opportunity provided by the Internet. Resolving the issues surrounding Internet fragmentation would help to fully unlock the positive potential of Internet-enabled trade.

2. The Good Story: Growth and Trade

The Internet has changed the calculus of who can fully engage in globalization by eliminating traditional barriers like distance, trust, and communication. Breaking down these barriers can enable businesses in sectors outside of manufacturing and agriculture to trade for the first time. Smaller businesses that traditionally could not find customers or establish relationships with international customers now can. Moreover, businesses no longer need to locate in large cities or coastal areas if they want to engage directly in trade.

Pioneering research done by eBay in 2012 demonstrated that even the smallest retail business could now go on the eBay platform and sell physical products around the world.[iv] Research we have been doing at PayPal builds upon the work of eBay, demonstrating that the benefits of digital are not limited to a sole platform or business model.

We analyzed a sample dataset of over 29,699 small businesses using PayPal across the United States from 2015 and 2016. We did a robustness check using a broader dataset of over 100,000 small businesses. We define small businesses in the PayPal dataset as those selling between $30,000 and $3

million per year. The National Small Business Association's 2016 year-end economic report found that over 65% of small businesses were in this revenue range.[v]   We found that small businesses that used PayPal demonstrate growth and exporting trends that are significantly different from traditional small businesses.
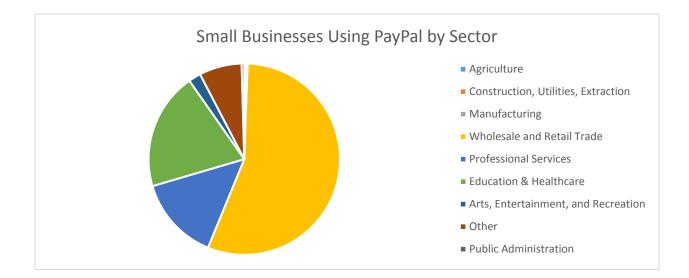
2.1   Small Business Export and Grow

Less than 5% of small businesses in the US engage in exporting.[vi] Businesses that use PayPal are disproportionately likely to be engaged in exporting; over 75% of the small businesses in our sample data set engaged in exporting in 2016. This makes intuitive sense. The Internet is a borderless platform that enables instant connection with customers on the other side of the world.

Exporting products and services yields enhanced productivity and employment.[vii] Literature on the gains from exporting have looked at total factor productivity (TFP) and found that exporters experience a premia of 4-18% in TFP vis-à-vis their non-exporting counterparts.[viii] We found that exporters using PayPal experienced a revenue premia of 43% over non-exporters using PayPal, and a 421% premia over traditional small businesses. Exporters using PayPal grew 32.8% year-over-year in 2016.

2.2   Services Business Export and Grow

Most research on exporting has looked at agriculture and manufacturing, in part because services were not often traded across borders. Services typically required physical presence in order to be delivered across borders. Retail sales were conducted in person; administrative services required the employees to be in the same office; and, technical services required onsite support. These were considered nontradeable services. Research from eBay has demonstrated that retail is now no longer nontradeable. Our research now demonstrates that the impact of the Internet on trade extends to nearly every subsector within services.

We excluded all eBay businesses from our sample set to eliminate the effect of the marketplace and to expand the insights beyond retail trade. While a large number of the small business exporters that we looked at were in the retail sector, we also found a significant number of businesses in professional services, education, the arts, and other categories. The chart below reflects the sectoral subdivisions of businesses we looked at on PayPal based upon the North American Industry Classification System (NAICS).

Small Businesses Using PayPal by Sector

Legend:
- Agriculture
- Construction, Utilities, Extraction
- Manufacturing
- Wholesale and Retail Trade
- Professional Services
- Education & Healthcare
- Arts, Entertainment, and Recreation
- Other
- Public Administration

In comparison, a recent survey by the Export-Import Bank of exporting small businesses found that just 15% export only services. Sean Luke, Vice President of Sales and Marketing at the Export-Import Bank stated that, "this fits our understanding that **many firms that deal in services struggle to find safe ways to export**, while firms that export physical goods are often able to do so".[ix]

2.3   Non-Urban Businesses Export and Grow

Economies across the US did not grow equally in 2015; the most recent year for which data on state-by-state growth is available. Coastal states with large city centers like California, Florida, and Massachusetts grew above the national average. Whereas heartland states with large rural areas like Louisiana, Oklahoma, and North Dakota saw growth rates well below the national average and in some cases negative growth rates.[x] This recent data demonstrates a trend that has been occurring for some time, which is the clustering of growth and trade in a few city centers, generally located on the coasts.

The Internet is enabling small businesses in the heartland and in rural areas to grow at unprecedented rates. Heartland small business exporters actually outperformed their coastal counterparts in 2016. In US towns with less than 50,000 people, small businesses using PayPal were just as likely to export and had similar growth rates the exporters had similar growth rates to their large city counterparts.

3. The Not So Good Story: Fragmentation and Localization

Fragmentation has been a concern for stakeholders since the inception of the Internet. The initial concern was with technical fragmentation (the use of alternative protocols), but now government policies related to the content layer of the Internet is where fragmentation concerns are increasingly being raised.

In recent years, a range of legal and regulatory proposals in countries around the world have sought to limit or prohibit the transmission of cross border data flows.[xi] These restrictions can come in the form of broad-based economy wide legislation or targeted sectoral regulation. Oftentimes, these proposals are meant to address important policy concerns, but the result can sometimes be to restrict legitimate trade.

Some governments are concerned about national security and therefore utilize localization mandates to prevent flows coming from certain jurisdictions or through certain entities. Concerns about dissent and speech can also motivate localization mandates. Governments are also concerned about privacy, in particular when the Internet enables companies to engage in the gathering and use of personally identifiable information. Governments can also be motivated to act by competitive concerns about the proliferation of large foreign Internet companies. Lastly, as the Internet pervades every sector of the economy, traditional regulation of transportation, health care, financial services, and other sectors can also run head long into the global nature of the Internet.

The reaction of many governments to these concerns has been to propose some form of data localization. The proposals can be as innocuous as requiring the use of a local domain name to a blanket requirement to localize all services and systems. Requirements can be sectoral or economy wide. The most commonly discussed proposal in the literature is a requirement to locate domestic consumer information on local servers.

Data localization has negative implications from both an economic and security perspective. A 2014 analysis by the European Centre for International Political Economy found that if the EU were to implement proposed data protection measures, GDP and foreign investment would decline by nearly one-half of one percent and four percent, respectively.[xii] Moreover, security networks are only as vulnerable as their weakest link. Proliferating data centers will reduce the ability of businesses to maintain security and newly formed data centers will be particularly subject to security threats.

The target of these data localization measures are often large companies that are sectoral leaders, have large technology footprints, or provide key Internet services. The research described in the section above, however, demonstrates that SMEs, non-traditional sectors, and underserved businesses would also be hit by localization measures that fragment the global Internet. That is why getting the global rules for Internet-related regulation and legislation is so critical.

4. The Tool of Trade Policy: One Among Many in the Fight against Fragmentation

Many trade scholars view data localization as a "new issue," but it is merely a modern manifestation of a classic trade concern. Domestic policymakers have for many years responded to foreign competition with requirements to localize. Recent data localization requirements have led trade policymakers to prioritize commitments on cross border data flows in modern trade agreements.

The Trans-Pacific Partnership (TPP) was the first trade agreement to include binding language on data flows. Unfortunately, the US voted to withdraw from the TPP and the future of the agreement remains unknown. But, it is worth noting that the TPP language was not perfect. The Electronic Commerce chapter of the TPP, which contains the important language on free flow of information and localization explicitly excludes "financial institutions" and "cross border financial services."[xiii] Meaning that the financial services sector would not be able to take advantage of the TPP language.

The Trade in Services Agreement (TISA) is a plurilateral agreement being negotiated between a diverse group of countries including Pakistan, Panama, South Korea, and Turkey. A leaked version of the Annex on Electronic Commerce includes a proposal from Canada, Colombia, Japan, Taiwan, and the US that would strongly discourage data localization mandates.[xiv]

The Transatlantic Trade and Investment Partnership (TTIP) is an effort to create a free trade zone across the Atlantic between the United States and the European Union. It seems likely that the TTIP would include a US proposal on data flows similar to the one it proposed in both TISA and the TPP. Notably, The European Parliament has recommended that the cross border flows of data provisions in TTIP should be consistent with existing European Union privacy law.[xv] Political changes in the US and UK have thrown both the TISA and the TTIP into limbo for the time being.

Despite the struggles to get individual trade agreements ratified, trade policy would seem to be an ideal tool to govern cross border data flows and prohibit improper localization requirements. Trade law contains important exceptions for national security and privacy. The jurisprudence of trade law, however, enables a reviewing court to "look behind the veil" of national legislation to determine if it is being, "applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where like conditions prevail, or a disguised restriction on trade."[xvi] This standard is objective and one that should enable legitimate policy regimes to stand, while challenging regimes that are actually designed to further protectionist motives.

Trade policy on data localization does not take place in a vacuum; it interweaves with conversations in other stakeholder fora where issues related to fragmentation are discussed. Telecommunication stakeholders like the International Telecommunications Union will note when countries sign binding trade agreements on cross border data flows. Multistakeholder fora like the Internet Governance Forum have taken a strong interest in trade policy in recent years. Moreover, as the Internet begins to transform traditionally regulated sectors like health care and financial services, international financial and health regulatory bodies will also likely reference anything done in the trade policy context.

Stakeholders in these other fora are concerned about rules being created in the trade arena that will limit the flexibility to create rules in other contexts. This concern, however, should be assayed by the idea that trade policy is primarily focused on preventing domestic legislation that is "more trade restrictive than necessary," not to prevent domestic policymakers or other international fora from creating rules related to security, privacy, consumer protection, or other matters of domestic and international concern. Trade policy has successfully played this role in other sectors like food safety and there is no reason to think that a similar role could not be played in the Internet context.

Trade policy should be considered just one tool among many in the fight against fragmentation. Discussions among telecom regulators, finance regulators, health ministers, multistakeholder fora, and countless other international discussions will also touch upon the topic of fragmentation. These discussions should inform one another, and each should champion the vision of a single interconnected Internet.

5. Conclusion

The Internet does not discriminate based upon size, sector, or location of a business. A small services business in a rural town can now leverage the Internet to grow and export. The Internet presents an unprecedented opportunity for inclusive growth. If we truly want to see a democratization of globalization, however, we need a truly global Internet.

The problem of fragmentation is a global one. Domestic policymakers are concerned about the consumer protection, privacy, and security practices of Internet-related services. The use of data localization to mitigate these concerns, however, can have negative economic and security consequences both for domestic and international stakeholders.

Trade policy has a role to play in preventing the further fragmentation of the Internet, but it is a limited role. Trade policy is designed to ensure that domestic policymaking does not create unnecessary barriers to trade. Trade policy also contains important exceptions for issues of domestic concern like privacy and security. This tool should work alongside policy created by international policymakers as well as multistakeholder fora in an effort to limit fragmentation.

[i] Head of Global Public Policy, PayPal; Adjunct Professor of Law, Georgetown University
[ii] Marc Andressen, Why Software Is Eating The World, Wall Street Journal (Aug. 20, 2011)
[iii] PayPal, Democratizing Globalization (2017)
[iv] Lendle, et. al. There Goes Gravity, The Economic Journal (2016)
[v] NSBA, 2016 Year-end Economic Report
[vi] SBA Office of Advocacy, US Small Business Profile, 2016
[vii] Andrew B. Bernard and J. Bradford Jensen, Exporting and Productivity, NBER Working Paper 7135 (May 1999)
[viii] Andrew B. Bernard and J. Bradford Jensen, Exceptional Exporter Performance: Cause, Effect, or Both?, Journal of International Economics (1999)
[ix] Sean Luke, 7 Exporting Takeaways from the 2016 Small Business Exporting Survey (May 7, 2016)
[x] SBA Office of Advocacy, US Small Business Profile, 2016
[xi] Ahmed & Chander, Information Goes Global, E15 Think Piece (Nov. 2015)
[xii] ECIPE, The Costs of Data Localisation: Friendly Fire on Economic Recovery (2014)
[xiii] TransPacific Partnership, Chapter 14.1
[xiv] TISA Annex on Electronic Commerce, Wikileaks release June 3, 2015
[xv] European Parliament, Resolution of 8 July 2015 containing the European Parliament's recommendations to the European Commission on the negotiations for the Transatlantic Trade and Investment Partnership (TTIP) (2014/2228(INI))
[xvi] General Agreement on Trade in Services, Article XIV