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Toward a Crypto-friendly Index for the APEC Region

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Abstract

This paper presents a new index concerning the extent of public policy accommodation towards usage of blockchain technology. The coverage of the index is for the 21 Asia-Pacific Economic Cooperation (APEC) member states, representing a significant bloc of global production, trade and economic development. The crypto-friendly index includes indicators related to four general categories of blockchain policy: (i) extent of policy restrictiveness toward cryptocurrency initial coin offerings; (ii) extent of policy restrictiveness toward cryptocurrency exchanges; (iii) taxation treatment toward cryptocurrencies; and (iv) type and extent of general public policy interest in blockchain-related activity. Based on data and information available as at October 2018, the index results reveal considerable diversity exists amongst APEC countries in terms of their degree of crypto-friendliness. Jurisdictions such as Hong Kong, Singapore, Australia, the United States and Canada are seen as relatively crypto-friendly locations, whereas jurisdictions such as China, Vietnam and Peru have the greatest scope for pro-blockchain policy improvement. This paper suggests future avenues for index refinement, as well as the potential for additional research into the concept of crypto-friendliness using this and similar policy indexes.

Keywords: *APEC region, blockchain, crypto-friendliness, index, ranking*

JEL Classifications: *C80, K2, K34, O38, P50*

1. Introduction

Blockchain technology is a distributed, digital, peer-to-peer ledger that records, verifies and validates data on its public database without recourse to a centralised authority, or intermediary, to manage the data. High-powered cryptoeconomic incentive mechanisms securely verify data blocks entered on the blockchain and ensure that all parties reach consensus about facts needed to propagate economic, financial, political, social and other projects. As such, the blockchain represents a contemporary refinement of ledger technologies that record and disseminate transactional and other facts underpinning multi-person coordination.

Blockchain is widely touted as a ledger technology suitable for transforming the operational and governance environments of business, government and civil society. It is supposed that blockchain will not only bring about production efficacies and cost savings but will, ultimately, bring about better governance [1]. What started out as the technology underpinning the Bitcoin crypto-currency has mushroomed into fields as diverse as financial management, personal identity, property titles, supply chain relationships, even voting. Irrespective of their backgrounds, ideals and interests, people can leverage the blockchain to develop robust and self-executing contracts, to track payments from sender to receiver in real time and launch new investment projects. Whereas interest in blockchain and its applications have exploded in recent years there are many factors which will, ultimately, have a bearing upon the rate of adoption and practical uses of this technology. One of the more pivotal of these factors is the stance of public policy treatment toward blockchain. The significance of policy here is that it territorially influences the set of viable blockchain-enabled activities within, and amongst, political jurisdictions. Even at this relatively early stage of blockchain diffusion, policymakers in some countries are enacting policy change either to encourage internal blockchain activity, or to attract blockchain investment from other places. Policymakers in other locations, still, are acting to

repel blockchain usage in their jurisdictions.

We suggest that differing degrees of policy accommodation toward blockchain can be referred to as variations in "crypto-friendliness" extended by policymakers amongst jurisdictions. So-called "crypto-friendly" jurisdictions see blockchain as a lucrative opportunity for economic development, proactively clarifying regulatory and tax treatments of cryptocurrency and other blockchain applications, and trialling blockchain uses in fields predominated by public sector activity. Policymakers in countries hostile toward blockchain-related activity have, by contrast, instigated bans or strict limitations with respect to blockchain engagement by developers and users. We label hostility or aversion toward blockchain as examples of "crypto-unfriendliness." In other words, the degree of observed crypto-friendliness by a country is situated on a crypto-friendly (policy accommodation) versus crypto-unfriendly (policy suppression) spectrum.

The theoretical basis for crypto-friendliness is being developed by blockchain researchers [2, 3, 4, 5]. This paper takes the crypto-friendliness literature one step further, presenting an index measure of the degree of crypto-friendliness observed amongst Asia-Pacific Economic Cooperation (APEC) member countries. Drawing from a range of information sources, including blockchain analysts, crypto-currency specialists and mainstream business media outlets, we develop indicators of public policy positions toward blockchain. From these indicators it is possible to construct a holistic index ranking the degree of crypto-friendliness across countries. This crypto-friendly index provides some insight for blockchain developers, information technology and other businesses, governments and other interested parties in terms of which APEC countries are demonstrating crypto-friendly blockchain leadership and which countries have scope for public policy improvements.

The structure of this paper is as follows. In Section 2 we outline the methodology and information sources used in the development of the crypto-friendly index. In Section 3 we provide the results of our index analysis (applicable as at October 2018), indicating countries within the APEC region maintaining policies which are relatively crypto-friendly or crypto-unfriendly. A brief conclusion, primarily focused upon potential research resulting from the development of the crypto-friendly index, follows.

2. Methodology

A range of policy categories are established for the 21 APEC member countries.[1] Within those categories are a range of indicators which reflect specific kinds of policy treatment of blockchain and its applications (particularly crypto-currencies). Scores are allocated to each indicator, as specified below, and these are aggregated across the categories to provide an overall crypto-friendly index value. This overall index value can be used to help inform assessments about the degree of crypto-friendliness maintained by each jurisdiction.

The following provides descriptions of each indicator utilised for each category of the crypto-friendly index. Country-specific policies and information sources are also disclosed (see Supplemental Material). It should be noted that information used to inform the indicators are applicable to policies imposed by the central government of each country, excluding sub-national jurisdictions.

Category A: ICO restrictiveness

One of the pivotal activities undertaken within crypto-currency markets is fundraising for development and other projects through the creation and sale of digital tokens. This process is commonly known as an "initial coin offering" (ICO), and is serving as a mechanism to facilitate the growth of blockchain-enabled ventures. As explained by Van Rijmenam and Ryan, "[a]n ICO is increasingly being used by Blockchain start-ups to raise money by distributing a percentage of the initial coin supply. Basically, with an ICO a start-up plays the role of a bank; it digitally creates money out of nothing and sells that to 'investors'. The tokens, or crypto-coins, which are sold during the crowd sale will be used on the platform to pay for transactions and distribute value across the stakeholders. 'Investors' who purchase these coins during the ICO do not get a share in the start-up, but they hope that the price of the coin will rise and as such they can get a (substantial) return on their investment" [6, pp. 24-25].

According to statistics supplied by ICO Data [7], the aggregate global amount of funds raised through ICOs has risen substantially over the last few years. In 2014 over US $16 million was raised through two ICO ventures, rising to over US $6 billion in 2017 (through 873 ventures). The aggregate value of ICOs from January to September 2018 (US $7 billion, and 1,095 ventures) has surpassed the total for the entirety of the previous calendar year. Part of this growth is attributed to the fact that, in addition to ICO engagement by the "crypto community," legacy businesses with established services and products are using ICO fundraising to finance their business activities [8].

As with other forms of investment ICOs carry with them considerable risks and uncertainties. Aside from the uncertainties surrounding the potential for a given ICO venture to achieve an insufficient return, there is a fear that ICOs may be surrounded by misrepresentation, fraud and manipulation [9]. Expected future returns may be inflated by ICO proponents, and a lack of transparency may surround the identity of those advancing an ICO and the degree of information provided to potential investors. There may also be concerns that ICOs are being used as a vehicle to finance illicit activities.

It is for these, and other, reasons that governments have indicated a growing interest in regulating ICO activities. Although regulatory settings in this financial space, and in similar contexts, are designed to filter out unproductive and malign activities, there is the additional risk that overly prescriptive ICO regulations may limit the potential of

blockchain participants to raise sufficient funds for productive and licit purposes. This provides the basis for establishing a crypto-friendliness index category to track the degree of ICO restrictiveness by country.

Indicator 1: ICO regulatory stance

This indicator represents the general stance of regulators toward ICO activities in blockchain spaces, ranging from "allowed," "restricted," to "disallowed" as well as "neutral/no regulation." Countries which allow ICOs are allocated a score of 3, restricted countries are given a score of 1 and disallowed countries a score of 0. Countries which are regarded as neutral or having no regulation are allotted a score of 2, reflecting the notion that ICOs are permitted to take place even if unregulated. The score allocation reflects the generic view that countries allowing ICOs to operate within their jurisdiction are more crypto-friendly in this regard.

Indicator 2: Regulatory treatment by nature/purpose of ICO raising

APEC member countries which regulate ICOs can potentially make distinctions in regulatory treatment on the basis of the perceived nature and/or purpose of given ICO ventures. For example, regulators may distinguish between ICOs on the basis of their economic function – e.g. whether ICOs are seen as genuine investments involving the creation of assets, or are used to develop tokens used merely as a means of payment or value transfers. Countries which do regulate on the basis of the nature and/or purpose of ICO raising appear to be attempting to do so in order to facilitate an environment of productive fundraising through the blockchain, and are given a score of 1. Countries which do not provide such regulatory treatment are allocated a score of 0.

Category B: Crypto exchange restrictiveness

Another important feature of the blockchain ecosystem has been the development of "crypto exchanges." These virtual facilities enable users to trade crypto-currencies for traditional, "fiat" currencies or other crypto-currencies. For instance, a crypto exchange may enable individuals and organisations to buy and sell Bitcoin for Ether, Litecoin or any other crypto-currency, or buy and sell Bitcoin for US dollars, Japanese yen and so on. As explained by Rainer Böhme and colleagues, "most crypto exchanges operate double auctions with bids and asks much like traditional financial markets, and charge a commission ranging from 0.2 to 2 percent. Some exchanges offer more advanced trading tools, such as limit or stop orders. At present, many trades in bitcoin are accompanied by one or even two conversions from and/or to conventional currencies. Furthermore, price quotes in bitcoin are almost always computed in real time by reference to a fixed amount of conventional currency" [10, p. 220].

In a similar vein to exchange mechanisms for traditional currencies, securities and other financial instruments, crypto exchanges play an important role in facilitating transfers toward higher valued uses within the blockchain environment. According to data supplied by BitInfoCharts [11], the average transaction value of Bitcoin in September 2018 was US $23,709 whereas for Ethereum it was US $661 (data as at 20 September 2018). Much of the value exuded by such trades is conducted through crypto exchange platforms.

Many crypto exchanges are centralised, third-party intermediary platforms which are reasonably easy to use and provide ease of access. A problem with such exchanges is that they are either vulnerable to attack from malign sources or, lacking direct accountability (and control by) crypto-currency traders, susceptible to mismanagement. The Mt. Gox Bitcoin exchange, established in 2010 to become the largest crypto-currency exchange at the time, suspended trading, closed its website and exchange service, and filed for bankruptcy by 2014. It was reported that about 850,000 Bitcoins belonging to customers and the exchange were missing, presumed stolen, with a value in excess of US $450 million at the time [12]. The Binance crypto exchange temporarily halted trading in February 2018 in light of a potential phishing scam [13]. Alongside the potential of lax security and inadequate investor protections, crypto exchanges may fail due to a lack of liquidity or ambiguous clearance and settlement procedures.

Policy interest in crypto exchange platforms arise from a desire to protect investors and customers who trade in cryptocurrencies. Similarly, to regulations applicable to ICOs, governments have shown an inclination to regulate crypto exchanges in various ways. The issue is whether crypto exchange regulation facilitates the buying and selling of crypto-currencies to the interest of all participants, or whether regulation unduly hampers the development of crypto exchanges.

Indicator 3: Crypto exchange regulatory stance

This indicator represents the general stance of regulators toward crypto exchange activities, ranging from "allowed," "restricted," to "disallowed" as well as "neutral/no regulation." Countries which allow crypto exchanges to operate are allocated a score of 3, restricted countries are given a score of 1 and disallowed countries a score of 0. Countries which are regarded as neutral or having no regulation is allotted a score of 2, reflecting the notion that crypto exchanges can establish operations albeit in an unregulated manner. The score allocation reflects the generic view that countries allowing crypto exchanges to operate within their jurisdiction are deemed to be relatively more crypto-friendly.

Indicator 4: Application of Anti-Money Laundering (AML)/Counter Terrorism Financing (CTF)/Know Your Customer (KYC) regulation

This indicator scores jurisdictions based on their implementation of AML, CTF and/or KYC regulation. A score of 1 is allocated to countries that have implemented such regulations, whereas a score of 0 is given to those countries that have not introduced AML, CTF and/or KYC. The imposition

of such regulations is aimed at providing assurance to blockchain users that crypto exchanges are not channelling funds for illicit purposes, or at risk of being used for illicit purposes, thus providing a signal concerning the propriety of crypto exchange platforms.

Category C: Cryptocurrency tax treatment

In modern societies governments compulsorily acquire revenue from several sources to fund the production and provision of public goods and other essential services. One means through which the public sector acquires its revenue is through taxation – according to the OECD, taxes are compulsory unrequited payments to general government "in the sense that benefits provided by government to taxpayers are not normally in proportion to their payments" [14, p. 313].

In the interest of maintaining a diverse revenue base that is more robust to economic and other shocks, governments ordinarily impose taxation simultaneously upon a range of activities and sources. The OECD revenue classifications include reference to: taxes on income, profits and capital gains; social security contributions; taxes on payrolls and the workforce; taxes on property (including immovable property or on net wealth, gifts and estates); and taxes on goods and services (including excises and customs duties).

Governments have progressively investigated and, in some instances imposed, taxes on cryptocurrencies to prevent losses of potential taxation revenue resulting from the trading of cryptocurrency. As illustrated by the rise of certain forms of regulation upon cryptocurrency markets, governments have particularly revealed a concern about any "revenue leakage" resulting from the capability of cryptocurrency holders to avoid tax liabilities imposed within the conventional, non-blockchain economy. Given the multiple uses to which crypto-tokens are used it has been challenging for taxation authorities to incorporate cryptocurrencies into the framework of existing tax rules and legislation.

The extent of taxation policy interest in cryptocurrencies to date have largely surrounded the definition of tokens for tax policy purposes, and the treatment of income or, more generally, financial gains attained from cryptocurrency trades. The following indicators relate to taxes imposed by central governments only and exclude consideration of cryptocurrency tax regimes by sub-national levels of government.

Indicator 5: Taxation status of cryptocurrency

Certain countries have established definitions of cryptocurrencies within the context of existing taxation legislation and formal guidelines. In the broadest sense, cryptocurrencies to date have either been defined as akin to currency (albeit a privately issued form of currency not issued by the state), as a commodity like other commodities existing within the economic system, or as a form of property (or asset) like a financial security. Variations in the legal status of cryptocurrency have implications for when notifications of taxation liability are activated by fiscal authorities. Countries whose tax authorities or finance ministries have declared that cryptocurrency will be treated in a certain way are allocated a score of 1. By contrast, countries which have yet to declare a tax interpretation for cryptocurrency is allocated a score of 0 because of their uncertainty that a lack of clarity in tax treatment provides to domestic cryptocurrency users.

Indicator 6: Capital gains tax rate on cryptocurrency

Certain countries impose capital gains taxation on the capital gains (or profit) arising from the sale or disposal of an asset purchased or otherwise acquired. It is assumed that the cryptocurrency has been held as a long-term investment and the capital gains tax rate is applied to individual holders of cryptocurrency only. The capital gains tax rate selected is applicable to an earner bearing the top-tier marginal income tax rate. Capital gains tax rates are grouped into "low" (rates of 0-20 per cent), "medium" (20-40 per cent) and "high" (40+ per cent). Countries with low capital gains taxes are allocated a score of 2, medium tax-rate countries 1, and high taxing countries are given a score of 0. This scoring arrangement reflects the economic insight that capital gains taxes are assessed as being economic inefficient, distorting decisions to invest [15, 16, 17]. Note that if a country has not issued a formal declaration of cryptocurrency the capital gains tax rate is not applicable to the token and is thus allotted a 0 score.

Category D: General policy interest

There exist other measures which could be used to gauge the degree of governmental accommodativeness toward blockchain. These measures, by and large, relate to the preparedness of political actors to countenance the use of distributed ledger technologies in conventional fields of public sector activity – including public administration and service delivery (including judicial, legal and social services).

Indicator 7: Existence of public sector use cases

Countries that have trialled or permanently established blockchain use cases applicable to public administration or government service delivery are adjudged to be crypto-friendly. These countries receive a score of 1 for that category. Countries that have not instigated public sector use cases (including announcements of use cases that have yet to be trialled or otherwise implemented) receive a score of 0.

Indicator 8: Existence of regulatory "sandboxing" trials or policies

Several countries have instigated trials or permanent arrangements that enable participants to experimentally interact with each other, under closed conditions and with simulated (not actual) regulatory environments applying. During the testing period the participants are exempted from some, or all, actually-existing regulations in place [3]. These arrangements are known as "sandboxes," and are used by regulators to learn

about the effect of regulatory ideas under experimental conditions. Countries that have trialled or established sandboxing arrangements for blockchain applications (including FinTech) are assigned a score of 1, whilst those countries that have not engaged in sandboxing are given a score of 0.

3. Results

Variations in the degree of crypto-friendliness across countries are highly likely to be informed by policy differentials. In essence, jurisdictions toward the crypto-friendly end of the blockchain policy spectrum are more likely to proactively clarify the tax treatment of blockchain tokens and assets, and to not tax those instruments punitively. Measures attempting regulatory certainty with respect to crypto-economic activities, without undermining the growth and development of blockchain use and adoption, are also consistent with crypto-friendliness. Other features of a crypto-friendly policy environment include the facilitation of use cases, and the instigation of "sandboxing" or other regulatory trials of blockchain (including fintech applications, which typically incorporate blockchain elements).

The opposite of a jurisdiction pursuing crypto-friendliness in policy terms is a jurisdiction opting for crypto-unfriendliness, the latter posing an aversion toward the legitimisation of widespread economic coordination within the emerging crypto-economy. Policies consistent with this approach may include outright bans on blockchain application use by end-users or intermediaries (e.g. in relation to cryptocurrencies), stringent regulatory treatment (e.g. licensing blockchain participants, requirements to de-anonymise users), heavy or overtly discriminatory taxes, and the discouragement of use cases.

The results of the crypto-friendly index for the APEC region are illustrated in Table I, with the information in the Table affirming a clear dispersion amongst APEC member-states with respect to their crypto-friendliness. The assessment that is made here is that countries such as Singapore, Hong Kong, Australia, the United States, Canada, Japan and New Zealand are amongst the most crypto-friendly countries within the trading bloc. Malaysia, the Philippines and Chinese Taipei are also notable for their relatively high ranking on the crypto-friendliness index. Features which arguably distinguish these countries from their APEC counterparts are their accommodative regulatory approaches toward ICO and crypto exchange activities.

At the other end of the spectrum – i.e. countries which rank relatively low on the crypto-friendliness scale – are countries such as China, Vietnam, Peru, Chile, Brunei Darussalam and Indonesia. Most of these countries have assumed an openly hostile regulatory approach toward cryptocurrencies, and the use of blockchain more generally. In particular, ICO issuance and trades through crypto exchanges have either been explicitly banned within some of these jurisdictions, or such activities have been severely restricted through stringent regulation. It is also notable that crypto-unfriendly jurisdictions have yet to introduce formal guidelines or legislation to impose taxation upon cryptocurrency purchases or sales, which may create ambiguities or uncertainties amongst blockchain participants in relation to how the activities will be taxed into the future (if at all).

Conclusion

This paper presents a crypto-friendly index of blockchain policy accommodativeness for APEC-member countries. This composite index, which provides relative rankings for 21 countries, is based on an analysis of formal policies in relation to the treatment of ICOs and crypto-currency exchanges, as well as an assessment of the tax treatment of cryptocurrencies and the existence of public sector blockchain use cases.

The index is not intended to be definitive and will be subject to refinement as the evolution of policy responses toward blockchain continues to unfold in response to new opportunities and challenges. Further, there are opportunities to refine the methodology of the index as adoption of blockchain matures and new uses for this technology are discovered. In addition to developing indexes incorporating a larger cohort of countries, it is possible to extend the current index methodology to incorporate policies pursued by sub-national governments. Future research into the refinement of crypto-friendly indexes may embrace methodological alterations including subjective evaluations of taxation and regulatory climates by blockchain analysts and participants.

As indicated in this paper observable differences can be identified in terms of the policy treatment of blockchain technology and its applications within the APEC region, as of October 2018. This study indicates that countries such as the United States, Japan, Singapore, Australia and Canada have invoked relatively crypto-friendly policies comparable to best-practice standards found in jurisdictions such as Estonia, Switzerland and the United Arab Emirates. APEC member-countries which diverge from the crypto-friendly cohort have tended to do so either on the basis of a lack of formal policy position (at the time of writing this report) or, in some limited cases, adverse or hostile responses to certain aspects of blockchain activity such as ICO issuance or the operation of crypto exchanges. The findings of this crypto-friendly index provide diagnostics for relatively crypto-unfriendly countries to improve their relative ranking through the introduction of blockchain-accommodative policy reforms.

It is envisaged that the crypto-friendly index would serve as a platform for further academic and applied policy research into the nature of distributed ledger technologies and their impacts upon economies. Contingent upon the provision of a sufficiently minimal data sample size, it is possible to use this crypto-friendly index for empirical research. Some potential research opportunities include: is there a relationship between the degree of crypto-friendliness and the spatial distribution of blockchain-related activity? Are there any links between crypto-friendliness and background economic institutions, such as

Table I: Crypto-friendly index results for APEC member-states (information as at October 2018)

Country	Total score	ICO restrictiveness		Crypto exchange restrictiveness		Taxation treatment		General policy interest	
		Regulatory stance[a]	Regulatory treatment by nature/purpose of ICO[b]	Regulatory stance[c]	AML/CTF/KYC regulation[d]	Cryptocurrency tax treatment[e]	Capital gains tax rate[f]	Public sector use cases[g]	Sandboxing trials / arrangements[h]
Hong Kong, SAR China	13	3	1	3	1	1	2	1	1
Singapore	13	3	1	3	1	1	2	1	1
Australia	12	3	1	3	1	1	1	1	1
United States	12	3	1	3	1	1	1	1	1
Canada	11	3	1	3	1	1	0	1	1
Japan	11	3	1	3	1	1	0	1	1
New Zealand	11	3	1	3	1	1	1	1	0
Malaysia	10	3	1	3	1	0	0	1	1
Philippines	10	3	1	3	1	0	0	1	1
Chinese Taipei	9	3	0	3	1	0	0	1	1
Mexico	8	2	0	3	1	0	0	1	1
Korea, Republic of	7	0	0	1	1	1	2	1	1
Thailand	7	1	1	1	1	1	1	0	1
Papua New Guinea	6	2	0	2	0	0	0	1	1
Russian Federation	6	2	0	2	1	0	0	1	1
Brunei Darussalam	5	2	0	2	0	0	0	0	1
Chile	5	2	0	2	0	0	0	1	0
Indonesia	5	2	0	1	0	0	0	1	1
Peru	4	2	0	2	0	0	0	0	0
China	2	0	0	0	0	0	0	1	1
Vietnam	2	1	0	1	0	0	0	0	0

Notes: (a) Allowed (score=3), neutral/no regulation (2), restricted (1), disallowed (0). (b) Yes (1), no/n.a. (0). (c) Allowed (3), neutral/no regulation (2), restricted (1), disallowed (0). (d) Yes (1), no/n.a. (0). (e) Asset/commodity/money/property/other (1), none (0). (f) Low 0-20% (2), medium 20-40% (1), high 40%+ (0). (g) Yes (1), no (0). (h) Yes (1), no (0). For country information and sources informing the indicator scores, see Supplemental Material.

adherence to the rule of law and protection of property rights? How do assessments of crypto-friendliness relate to the structure of national innovation systems, and the possibility to undertake permission less innovation [18]? Is crypto-friendliness related to variables such as country size, labour market skills or general aptitudes towards technology and material progress?

The APEC region consists of a diverse cohort of countries, from developing to developed economies with a heterogeneous set of economic, cultural, social and political conditions. Technological advances such as blockchain provide the potential for closer trade, financial and economic integration amongst APEC economies, as well as lucrative opportunities for citizens residing in this region to enhance their social capabilities and harness economic development potential. Ultimately, blockchain is a governance technology and this fact suggests the need for coherent, whole-of-government responses within jurisdictions as well as cross-country collaborations amongst APEC members as a whole.

Whilst there remains an expectation that the extent of crypto-friendliness will continue to vary amongst APEC member-states for some time, the ability of governments to develop creative and flexible policy responses to the opportunities potentially posed by blockchain will be a critical determinant of the long-term economic success for the region.

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[i] The APEC member countries are: Australia; Brunei Darussalam; Canada; Chile; China; Chinese Taipei; Hong Kong, SAR China; Indonesia; Japan; Korea, Republic of; Malaysia; Mexico; New Zealand; Papua New Guinea; Peru; Philippines; Russian Federation; Singapore; Thailand; United States; Vietnam.

