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Property rights and shadow economies: A global perspective

Hoyong Jung
Graduate School of Public Administration, Seoul National University

Youngjae Hwang
Real Estate Department, Sogang University

Abstract

Many countries aim to reduce shadow economies due to the negative externalities they impose on society. This study examines the role of the property rights system and investigates how well-functioning property rights influence the underground economy from a multinational and multiperiod perspective. Employing two-way fixed effects and instrumental variable estimation, our findings confirm the prediction that the size of the shadow economy diminishes with the effectiveness of the property rights system. These results highlight the importance of establishing incentives for economic agents through the implementation of a robust private property system, which is essential for fostering both economic and social development.

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Contact: Hoyong Jung - ghdydwjd@snu.ac.kr, Youngjae Hwang - hyjestate@sogang.ac.kr.
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Property rights and shadow economies: A global perspective

1. Introduction

A shadow economy[1] refers to economic activities conducted outside the purview of official government statistics, through either legal or illegal means, to evade government interventions such as taxation, laws, and regulations (Schneider and Williams, 2013). The large scale of these activities generates negative externalities for both society and the economy, including decreased revenues for public goods, higher unemployment rates, and lower firm investments, all of which can adversely affect economic and social development (Berdiev, Saunoris, & Schneider, 2018; D'Agostino, De Benedetto, and Sobbrio, 2023). Consequently, a substantial body of literature has focused on examining the factors influencing the shadow economy and exploring government strategies to address these underground activities (Schneider and Enste, 2000).

One significant determinant of the shadow economy is the institutional quality of society (Torgler and Schneider, 2009; Schneider, 2010). As a fundamental pillar of social institutions, property rights can substantially influence the size of the shadow economy. Property rights, which involve exclusive rights granted to physical or intellectual property, determine the use and transfer of the associated payoffs (Besley and Ghatak, 2010). In the market economy, property rights are crucial for ensuring well-defined, enforced, and secured rights (Auerbach and Azariadis, 2015). Furthermore, in a market economy characterized by anonymity and one-off exchanges, property rights shape the incentives of individuals and society by defining the right to dispose of resources and prioritize conflicting interests. Specifically, in a society where private property rights are well established, citizens' property is protected by contractual relationships (Acemoglu and Johnson, 2005; Besley and Persson, 2009).

From this perspective, Lamoreaux and Wallis (2024) argue that a key feature distinguishing advanced capitalist democracies is their reliance on impersonal rules, which are uniformly applied to all, unlike identity rules that cater to specific individuals, groups, or localities and often lead to rent-seeking. These impersonal rules are crucial for the positive relationship between advanced democracy and capitalism, as they allow resources to flow freely to their most profitable uses—a hallmark of advanced capitalism. This shift not only renders the economy more dynamic and competitive but also enhances the stability and effectiveness of the political system. Within this context, a property rights system that legally safeguards private interests through equitable and efficient transactions aligns closely with these impersonal rules, reinforcing the broader institutional framework of advanced capitalist democracies.

Robust property rights are essential for reducing shadow economic activities by fostering legal certainty, encouraging tax compliance, supporting investment, and building institutional trust. They provide individuals and businesses with legal clarity, reduce transaction costs, and make participation in the formal economy more attractive. By mitigating risks of expropriation, property rights promote capital formation, innovation, and entrepreneurship.

[1] The shadow economy is commonly referred to as the underground, hidden, gray, black, or informal economy.

Additionally, well-functioning property rights systems strengthen trust in institutions, enhancing compliance with laws and encouraging formal economic engagement. Together, these mechanisms illustrate how institutional reforms can effectively curtail shadow economies.

These theoretical inferences enable us to hypothesize that a well-functioning property rights system constrains shadow economies. However, empirical evidence on this relationship remains limited. To address this gap, we construct an unbalanced panel dataset spanning over 20 years and 100 countries. Using two-way fixed effects (FE) and instrumental variable (IV) estimation, we examine the impact of property rights on shadow economies. Our study uniquely employs individualism—a cultural characteristic closely linked to institutional development—as the IV to causally assess the relationship between property rights and market formalization globally (Jung, 2025).[2]

The results demonstrate that a well-established property rights institution reduces the shadow economy. Our findings highlight the importance of a system in which the incentive structure for economic agents can function effectively and related efforts can be institutionally protected through property rights. Thus, this study contributes to the literature on institutional economics by exploring the relationship between property rights and the underground economy.

In the next section, we describe the data and empirical strategy employed in our study. Then, we present the estimation results and discuss the implications of our findings.

2. Empirical design

To measure the degree of the shadow economy across years and countries, we utilized the indicators provided by Medina and Schneider (2019). Their dataset offers information on the size of the underground economy in 157 countries spanning from 1991 to 2017.

Building upon the available data, we incorporate information on property rights. Given the unbalanced panel nature of the dataset across multiple periods and countries, some cases may have missing information. To address this limitation, we rely on multiple sources for property rights data and compare the estimation results to ensure robustness. Specifically, we use property rights indicators from Ouattara and Standaert (2020), Worldwide Governance Indicators, and the Fraser Institute.[3]

Furthermore, we consider other control variables that may be related to the shadow economy and property rights. These covariates encompass economic factors (such as GDP growth rate, GDP per capita, and inflation rate), demographic factors (population growth rate and senior population ratio), openness indicators (trade dependency ratio and globalization), and

[2] By focusing on the property rights system, this study extends the recent literature on the impact of economic freedom, which is closely linked to property rights (Berdiev, Saunoris, & Schneider, 2018; D'Agostino, De Benedetto, & Sobbrio, 2023).

[3] Worldwide Governance Indicators (http://info.worldbank.org/governance/wgi/), Fraser Institute (https://www.fraserinstitute.org/)

political characteristics (electoral democracy).[4]

We first employed two-way FE estimation with the following model specification:

$$\text{Shadow economy}_{ct} = \beta\text{Property rights}_{ct} + X_{ct}\Gamma + u_t + \lambda_c + \epsilon_{ct}$$

In the model, *c* represents a country, and *t* represents a year. X_{ct} denotes a set of control variables. The year fixed effect (u_t) captures the overall trend of the shadow economy and property rights, while the country fixed effect (λ_c) controls for country-specific unobserved time-invariant traits. Standard errors are clustered at the country level to account for potential heteroscedasticity.

The above regression model still encounters an endogeneity issue. For example, a reverse causal relationship is plausible wherein the property rights system is not adequately established as the shadow economy develops and rent-seeking activities become prevalent. To address this endogeneity concern, we employed the IV estimation.

In this context, individualism can serve as the IV for property rights (Jung, 2025). Existing research has emphasized culture as a significant determinant of individual preferences and social institutions (Guiso, Sapienza, and Zingales, 2006; Williamson and Kerekes, 2011). On the other hand, the formation of property rights institutions is influenced by various factors, including cultural elements (Bowles, 1998; Mijiyawa, 2013). As a primary indicator of cultural differentiation (Greif, 1994; Hofstede, 2001; Heine, 2007), individualism affects property rights institutions by shaping personal freedoms, incentivizing individual achievements, and encouraging self-reliance. Additionally, individualistic cultures tend to tolerate higher levels of inequality and promote competition, meritocracy, and universalistic principles. These characteristics of individualism contribute to the institutionalization of private property rights by establishing a system that supports individual economic activities and fosters free and competitive markets.

We employ Hofstede (2001) as a representative measure of individualism across countries, following various studies in the literature (Binder, 2019). The IV estimation is implemented using a two-stage least-squares regression as follows:[5]

$$\text{1st stage: Property rights}_{ct} = \beta\text{Individualism}_c + X_{ct}\Gamma + u_t + \epsilon_{ct}$$

$$\text{2nd stage: Shadow economy}_{ct} = \delta\,\widehat{\text{Property rights}}_{ct} + X_{ct}H + \pi_t + e_{ct}$$

Table 1 provides the descriptive statistics and sources of the variables used in the analysis. Figure 1 illustrates the country-level and annual trends of the shadow economy, while Figure 2 depicts the relationship between the average level of property rights and individualism by country.

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[4] Various sociodemographic and economic characteristics are utilized to construct the shadow economy index (Medina and Schneider, 2019). As a result, we incorporate representative socioeconomic variables as covariates in our analysis, and we present the estimation results with and without these control variables.

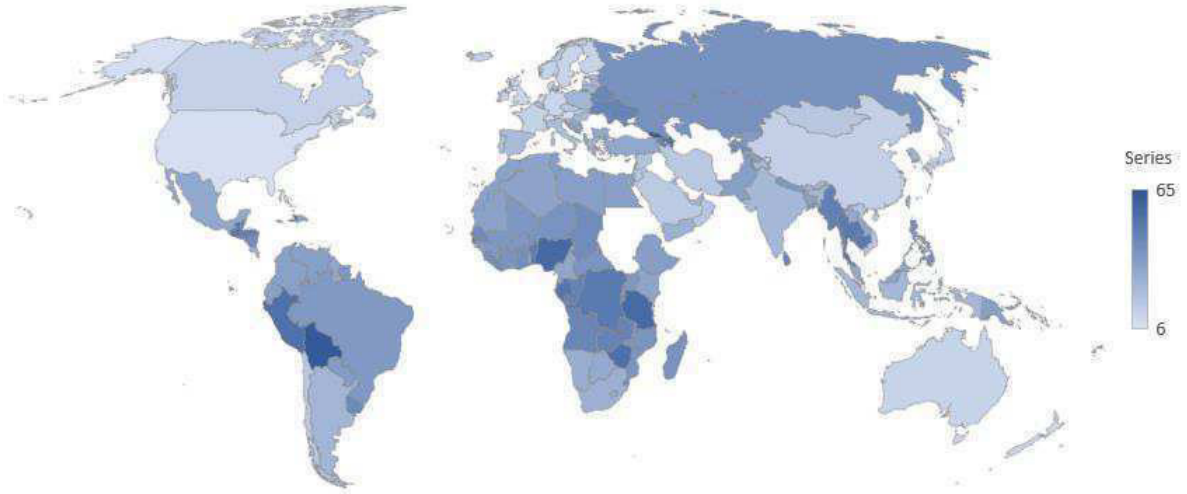
[5] As a cultural characteristic that develops over an extended period, individualism changes minimally over time. Indeed, Hofstede (2001) provides a constant value for individualism in each country. As a result, the IV estimation does not include country fixed effects.

Table 1. Summary statistics

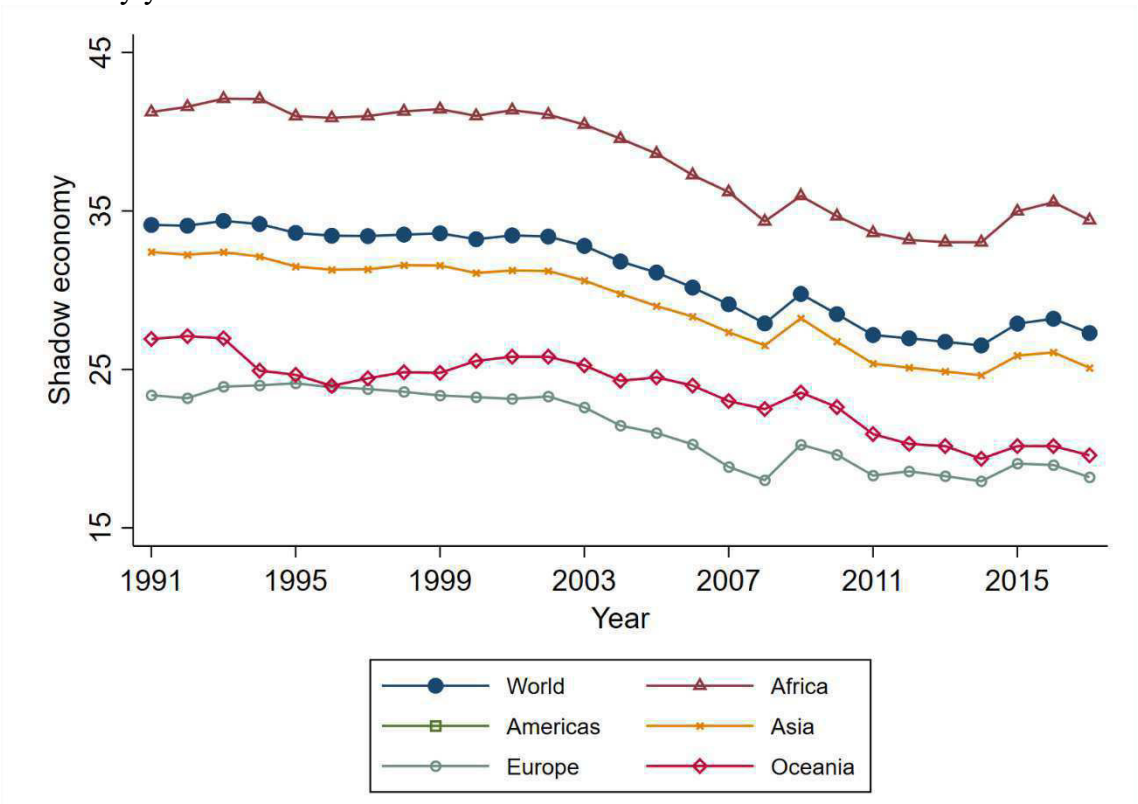
Variable	Mean	*SD*	Min	Max	*N*	Description	Source
Shadow economy	30.972	12.848	5.100	70.500	4239	Raw data cover 157 countries from 1991 to 2017, higher number indicates larger shadow economy	Medina and Schneider (2019)
Property rights [1]	51.910	3.668	44.669	60.550	3277	Raw data include 191 countries from 1994 to 2014, measuring level of property rights protection. Higher number indicates stronger property rights	
Property rights [2]	−0.053	0.991	−2.264	2.125	2964	Raw data capture rule of law and property rights quality for 200 countries from 1996 to 2021. Higher number reflects greater protection of property rights	Worldwide Governance Indicators
Property rights [3]	5.219	1.648	1.630	9.000	2888	Raw data assess the legal system and security of property rights for 165 countries from 1970 to 2020. Higher number indicates stronger property rights protection	Fraser Institute
Individualism	45.015	23.800	6.000	91.000	1809	Data represent individualism scores for 78 countries, higher scores indicate higher levels of individualism	Hofstede (2001)
GDP growth rate	3.751	6.258	−50.339	149.973	4089	Percentage	World Development Indicators
GDP per capita	10418	16181	53	123679	4138	US dollars	World Development Indicators
Inflation rate	38.201	528.554	−32	26766	4088	Percentage	World Development Indicators
Population growth rate	1.563	1.728	−22.348	19.360	4184	Percentage	World Development Indicators
Senior population ratio	7.239	5.286	0.172	28.464	4185	Percentage of population aged 65 and above	World Development Indicators
Trade dependency ratio	82.777	52.104	11.855	442.620	3871	Percentage of (Import+Export) to GDP	World Development Indicators
Globalization	0.515	0.372	0.000	1.000	4006	Higher number signifies greater globalization	KOF Globalisation Index
Electoral democracy	0.529	0.268	0.014	0.926	4085	Electoral democracy index, higher number indicates higher degree of electoral democracy	Varieties of Democracy

Figure 1. Shadow economy by country and year

Panel A. By country

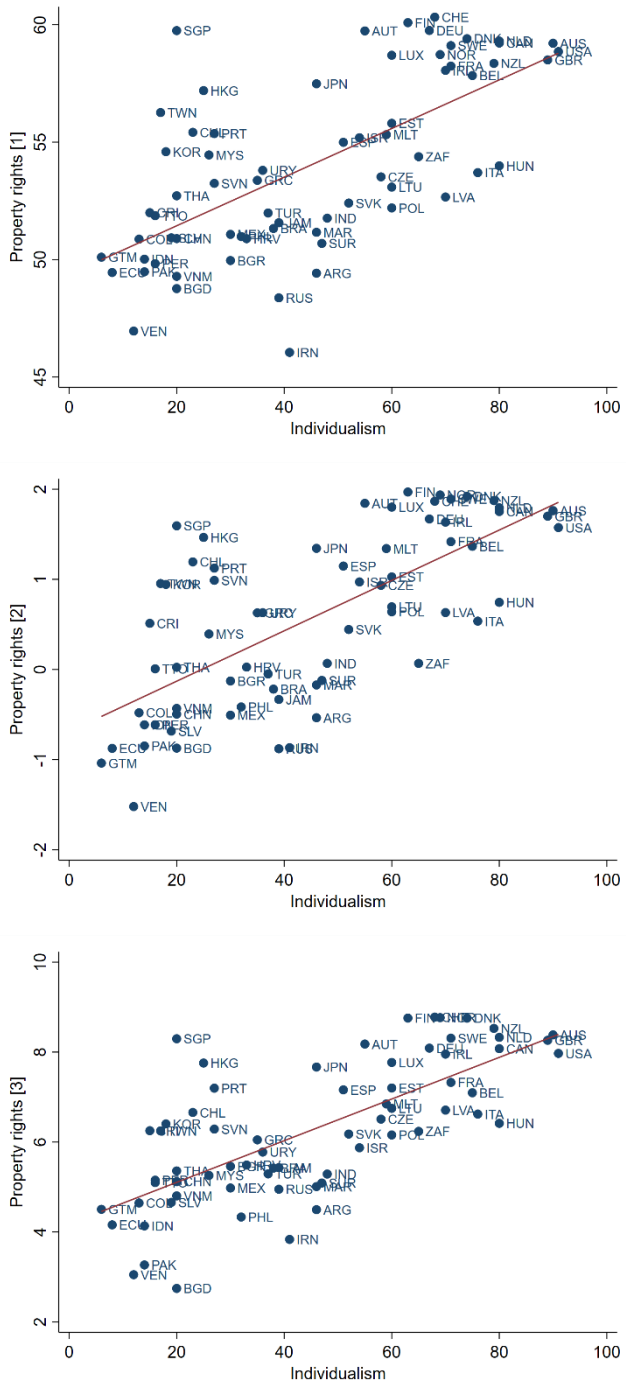


Panel B. By year



Note. The measurement of the shadow economy is derived from Medina and Schneider (2019), where a higher value indicates a greater extent of the shadow economy.

Figure 2. Relationship between property rights and individualism



Note. Property rights [1], [2], and [3] correspond to the indicators sourced from Ouattara and Standaert (2020), Worldwide Governance Indicators, and Fraser Institute, respectively. The individualism value for each country represents the average value across the years.

3. Results and discussion

Table 2 presents the results obtained through the two-way FE estimation. When using the property rights variable provided by Ouattara and Standaert (2020), the analysis shows that the shadow economy decreases as the property rights system develops, regardless of the inclusion of control variables (columns 1 and 2). These results remain consistent when utilizing the property rights indicators from Worldwide Governance Indicators (columns 3 and 4) or the Fraser Institute (columns 5 and 6).

Table 2. Two-way fixed-effect estimation results

	(1)	(2)	(3)	(4)	(5)	(6)
Property rights [1]	−0.519*	−0.588*				
	(0.257)	(0.278)				
Property rights [2]			−3.460***	−4.064***		
			(0.444)	(0.439)		
Property rights [3]					−0.773**	−0.612*
					(0.250)	(0.248)
Covariates	N	Y	N	Y	N	Y
Country FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
R^2	0.673	0.711	0.665	0.704	0.639	0.670
N	3277	2909	2964	2646	2888	2578

Note. Clustered standard errors at the country level in parentheses. Property rights [1] = Ouattara and Standaert (2020), Property rights [2] = Worldwide Governance Indicators, Property rights [3] = Fraser Institute.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3 presents the IV estimation results to address the endogeneity concerns. In the first stage, there is a clear positive relationship between individualistic culture and the property rights system, confirming the relevance condition of the instrumental variable. In the second stage, the development of property rights significantly reduces the shadow economy. These results hold across all cases of property rights indicators, including Ouattara and Standaert (2020) (columns 1 and 2), Worldwide Governance Indicators (columns 3 and 4), and the Fraser Institute (columns 5 and 6).

Table 3. Instrumental variable estimation results

	(1)	(2)	(3)	(4)	(5)	(6)
Second stage in IV estimation [Dependent variable: Shadow economy]						
Property rights [1]	−2.861***	−4.039**				
	(0.382)	(1.554)				
Property rights [2]			−10.286***	−17.376**		
			(1.244)	(5.559)		
Property rights [3]					−6.215***	−9.106**
					(0.815)	(2.965)
First stage in IV estimation [Dependent variable: Property rights]						
Individualism	0.103***	0.036**	0.028***	0.008**	0.046***	0.015***
	(0.013)	(0.012)	(0.003)	(0.003)	(0.005)	(0.004)

F statistic [1]	1053.363	157.169	1082.165	126.317	1225.999	168.884
F statistic [2]	67.767	8.853	72.939	8.033	79.641	11.504
Covariates	N	Y	N	Y	N	Y
Year FE	Y	Y	Y	Y	Y	Y
R^2	0.456	0.424	0.557	0.547	0.527	0.531
N	1458	1336	1273	1179	1273	1169

Note. Clustered standard errors at the country level in parentheses. Property rights [1] = Ouattara and Standaert (2020), Property rights [2] = Worldwide Governance Indicators, Property rights [3] = Fraser Institute, *F* statistic [1] = Cragg–Donald Wald *F* statistic, *F* statistic [2] = Kleibergen–Paap rk Wald *F* statistic.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Our findings indicate that well-defined property rights constrain the shadow economy, underscoring the importance of robust economic systems-for fostering market growth and mitigating informal economic activity. Establishing legal frameworks to protect property ownership should therefore be a key policy priority for governments.

To address the negative externalities of the shadow economy, governments can adopt various strategies. Direct regulations, such as monitoring and penalizing underground activities, may have limited effectiveness due to high costs and administrative burdens. A more sustainable approach involves establishing legal and institutional mechanisms that align economic agents' incentives with the goals of the formal economy while acknowledging their legitimate efforts.

Transparent legal frameworks that ensure equitable treatment signal to economic actors that their contributions will be recognized and rewarded. Offering tangible benefits for formal participation, such as access to social security, legal protections, or financial services, further incentivizes the transition from informal to formal operations. Such measures reduce tax evasion, enhance regulatory compliance, and promote greater participation in the official economy.

Over time, increased formalization leads to higher tax revenues, enabling governments to improve public services and infrastructure. These improvements, in turn, strengthen institutional trust and create a virtuous cycle of economic growth and compliance, further weakening the shadow economy.

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Appendix. Countries considered in this study

Region	Countries		
Africa	Algeria	Equatorial Guinea	Mauritius
	Angola	Ethiopia	Morocco
	Benin	Gabon	Mozambique
	Botswana	Gambia, The	Namibia
	Burkina Faso	Ghana	Niger
	Burundi	Guinea	Nigeria
	Cabo Verde	Guinea-Bissau	Rwanda
	Cameroon	Kenya	Senegal
	Central African Republic	Lesotho	Sierra Leone
	Chad	Liberia	South Africa
	Comoros	Libya	Swaziland
	Congo, Dem. Rep.	Madagascar	Tanzania
	Congo, Rep.	Malawi	Togo
	Cote d'Ivoire	Mali	Tunisia
	Egypt, Arab Rep.	Mauritania	Uganda
			Zambia
			Zimbabwe
Americas	Argentina	Ecuador	Peru
	Bahamas, The	El Salvador	Suriname
	Belize	Guatemala	Trinidad and Tobago
	Bolivia	Guyana	United States
	Brazil	Haiti	Uruguay
	Canada	Honduras	Venezuela, RB
	Chile	Jamaica	
	Colombia	Mexico	
	Costa Rica	Nicaragua	
	Dominican Republic	Paraguay	
Asia	Armenia	Japan	Philippines
	Azerbaijan	Jordan	Qatar
	Bahrain	Kazakhstan	Saudi Arabia
	Bangladesh	Korea, Rep.	Singapore
	Bhutan	Kuwait	Sri Lanka
	Brunei Darussalam	Kyrgyz Republic	Syrian Arab Republic
	Cambodia	Lao PDR	Taiwan
	China	Lebanon	Tajikistan
	Cyprus	Malaysia	Thailand
	Georgia	Maldives	Turkey
	Hong Kong SAR, China	Mongolia	United Arab Emirates
	India	Myanmar	Vietnam
	Indonesia	Nepal	Yemen, Rep.
	Iran, Islamic Rep.	Oman	
	Israel	Pakistan	
Europe	Albania	Iceland	Spain
	Austria	Ireland	Sweden
	Belarus	Italy	Switzerland
	Belgium	Latvia	Ukraine
	Bosnia and Herzegovina	Lithuania	United Kingdom
	Bulgaria	Luxembourg	
	Croatia	Malta	
	Czech Republic	Moldova	
	Denmark	Netherlands	
	Estonia	Norway	
	Finland	Poland	
	France	Portugal	
	Germany	Russian Federation	
	Greece	Slovak Republic	
	Hungary	Slovenia	
Oceania	Australia		
	Fiji		
	New Zealand		
	Papua New Guinea		
	Solomon Islands		