

**Calling Democracies and Dictatorships:
The effect of political regime on international long-distance rates**

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November 2011

Abstract: When placing an international telephone call, does the cost depend on whether the person on the other end of the line is in a democracy? Telephone service is naturally monopolistic, and democratic governments have stronger incentives to regulate these industries more efficiently than do autocratic governments. In contrast, autocracies have incentives to limit communication between their citizens and the rest of the world. We thus suspect the price of international long-distance to vary with political regime. We test this hypothesis using a cross-section of 156 countries, controlling for many factors that may impact long-distance pricing, and find evidence of a democracy-discount. It is less expensive to call landlines in democracies by 39 percent and mobile telephones by 19 percent.

1. Introduction

During the Arab Spring, one target of protestors in Syria was Rami Makhoul, who owns Syriatel, a Syrian telecommunications company. He also happens to be the first cousin of President Bashar al-Assad. Makhoul has been identified by the US Treasury Department as having benefited from corruption in the Syrian autocratic government. The announcement by the Treasury department declared that Makhoul “has manipulated the Syrian judicial system and used Syrian intelligence officials to intimidate his business rivals. He employed these techniques when trying to acquire exclusive licenses to represent foreign companies in Syria and to obtain contract awards.”¹ As shouted by the chanting crowds in the streets of Dara’a, a Syrian border town, “We’ll say it clearly: Rami Makhoul is robbing us!”²

Meanwhile, during the same time period in the United States, the US Justice Department announced that they would fight the proposed \$39 billion merger between AT&T and T-Mobile, citing that ninety percent of the US mobile phone market is controlled by only four firms, including AT&T and T-Mobile. Parul Desai, a consumer advocate, stated that “this announcement is something for consumers to celebrate... We have consistently warned that eliminating T-Mobile as a low-cost option will raise prices,

¹ “Target of Deadly Protests In Syria Has US Investments,” *Forbes*, 22 March 2011.

² “Syrian Businessman Becomes Magnet for Anger and Dissent,” *New York Times*, 30 April 2011.

lower choices and turn the cellular market into a duopoly controlled by AT&T and Verizon.”³

These parallel stories raise an important question: When placing an international telephone call, does the cost depend on whether the person on the other end of the line is in a democracy? We argue that it does because democracies and dictatorships face incentives running in opposite directions. Drawing on Regulation Theory, we argue that democratic governments have stronger incentives to regulate monopolistic industries more efficiently than do autocratic governments. Drawing on recent theories of diffusion, we further argue that dictatorships have incentives to limit communication between their citizens and the rest of the world.

Telephone networks generate increasing returns to scale, and the role of the state in regulating this naturally monopolistic technology has long been questioned (e.g., Peltzman 1976, Stigler 1971). The effectiveness of the state, in turn, has oft been proposed to depend on the type of political regime. The influential “selectorate” model of politics explicitly suggests that democracies have stronger incentives than dictatorships to provide public goods (Bueno de Mesquita et al. 1999, 2003; McGillivray and Smith 2008). One such public good may be the effective regulation of telephone companies.

Regulation Theory suggests that the telephone industry is ripe for rent-seeking, and many have proposed that authoritarian governments have particularly strong

³ “US Moves to Block Merger Between AT&T and T-Mobile,” *New York Times*, 31 August 2011.

incentives to engage in such behavior. Still, some scholars contend that political regime makes little difference in the delivery of public goods (Ross 2006, Keefer 2008). When it comes to international long-distance, the person making the phone call is, obviously, not located inside of the country in question, implying tenuous accountability at best. Yet, citizens inside of the country may benefit from receiving international phone calls, and the person calling from abroad may actually be a traveling citizen. Moreover, citizens can be directly impacted when they make outgoing calls: As we discuss below, the cost of incoming long-distance impacts the outgoing price through various reciprocal arrangements across telecommunication companies. So, it is plausible that international long-distance calls to democracies are less expensive than calls to dictatorships.

Lower-prices imply more communication. Recent work on diffusion suggests that dictatorships have incentives to reduce and control the level of communication between their citizens and the rest of the world. A host of political phenomena have been found to spill over from country to country, including, importantly, the collapse of dictatorship (Gleditsch 2002, Simmons and Elkins 2005). Cross-border communication is one theorized mechanism by which such diffusion occurs. If survival in office is the primary goal of governments, and autocrats may be threatened by communication with the outside world, they have incentives to reduce the flow of information that crosses borders (Milner 2006). On the margins, higher prices for calling into a country reduces communication.

The incentives for democracies and dictatorships thus cut in different directions, and we therefore expect it to be less expensive to call a democracy than a dictatorship. We explore this hypothesis empirically by testing the effect of political regime on

international telephone call rates. Our dataset is a cross-section for the year 2010 with 156 countries, including 89 democracies and 67 authoritarian regimes. Our dependent variable is the “Average Revenue Per Minute” (ARPM), a standard industry measure that captures the cost of calling a country averaged across a range of originating countries.⁴ For robustness, we also analyze the rate charged by a low-cost provider to call each country from a neutral democracy, Switzerland, and from an economically advanced authoritarian country, Singapore.⁵

We measure our principal explanatory variable, political regime, using the Cheibub et al. (2010) “DD” dichotomous indicator. We also control for level of economic development, population size, degree of urbanization, international trade, foreign direct investment, remittances, land area, as well as similar language groupings and regions.

To anticipate our results, we do find it less expensive to call democracies than dictatorships. According to the mobile ARPM measure, calling democracies costs less by about 2.56 cents per minute. Considering that the average long-distance cost is 13.32 cents per minute, the effect represents a 19 percent democracy-discount. The discount is bigger for calling landlines. According to the fixed-line ARPM, calling democracies costs less by about 3.26 cents per minute. As the overall average rate is 8.34 cents per minute, this effect represents a 39 percent democracy-discount. Results are similar when calling specifically from Switzerland: the democratic discount is 17 percent for mobile numbers

⁴ A more complete explanation concerning ARPM and the basket of countries can be found in the Data section of this paper.

⁵ A full dyadic dataset is unavailable.

and 27 percent for landlines. Calling democracies from authoritarian Singapore is also less expensive, further suggesting that the discount we observe comes from the recipient country. The discount is 12 percent.⁶

The rest of this paper is organized as follows. Section two explains the international accounting mechanics of long-distance telecommunications, while section three presents our argument. Section four presents the data, method, and results. Section five returns to recent events in the Middle East and the United States regarding the regulation of telecommunication.

2. The political-economy of international phone calls

Monopolistic companies used to dominate the international long-distance market completely. International telephone carriers had bilateral agreements to connect customers around the world with other carriers.⁷ Each carrier charged a customer a tariff

⁶ These estimates are based on our preferred model specifications, which include the statistically significant control variables. They come from models 3, 6, 9, 12, and 15 of tables 1-3, respectively.

⁷ See InfoDev and International Telecommunication Union (2011): Section 3.6.1, available <http://www.ictregulationtoolkit.org/en/Section.2145.html> (accessed 19 September 2011), and International Telecommunications Union (2011): Chapter 6, available: <http://www.itu.int/osg/spu/intset/whatare/wtdr/wtdr.html>, (accessed 19

(the quoted price) and if there was a net imbalance of traffic between countries, the carrier which terminated more calls was paid a settlement by the other carrier – the “accounting rate.” In the mid-1990s, US carriers paid out over \$5 billion in settlement payments to foreign telecommunications companies due to an imbalance of traffic (Alleman 2008). Due to these unfavorable terms for certain key telecommunications companies, other methods of delivering voice traffic developed. The European Communications Committee (2003: 9) found that by 2003 only 15 percent of international voice traffic was subject to the traditional accounting rates regime – with further declines expected in the future.

New methods now exist to funnel traffic around the traditional arrangements. For example, “reorigination” (also called refiling or hubbing) re-routes a call through a location that has a lower accounting rate with the terminating country.⁸ This is a method to disguise the true origin of the call, and it is practiced by many of the major carriers.⁹ Also, some telecom carriers build and maintain their own global networks. Other carriers

September 2011). For a game theoretic approach to accounting rate negotiations see Ju and Tan (2010).

⁸ See InfoDev and International Telecommunication Union (2011): Section 3.6.1.

⁹ Telecom arbitrage allows customers to make “free” long-distance calls through access numbers; the providing company charges the customer for using the customer's monthly minutes. Callback allows a customer to dial a phone number in a country with a cheap tariff, which triggers a return call to the customer's phone, who then calls the desired country. See InfoDev and International Telecommunication Union (2011: Section 4.3.1).

purchase access to existing networks through a wholesale market, which allows companies to purchase or sell excess capacity or purchase additional minutes to satisfy contracts made under the accounting rate regime. The expansion of Voice over Internet Protocol (VOIP) has further liberalized international telecommunications.¹⁰

So what then determines the price of international long-distance? The simple answer is that the quoted price still reflects the costs of both routing the call (from the originating country) and terminating the call (in the receiving country). High costs in international long-distance can be understood to be passed on to customers in both countries. Importantly, the more expensive it is for foreign customers to call into a country, the more it will cost for citizens to call out of that country.¹¹ The country's government can therefore exert a substantial impact on the price of international long-distance.

¹⁰ Note that as more telephone traffic shifts to VOIP, governments will have less volume to regulate. Governments may thus increase their regulatory authority with respect to the internet. See "Internet Gets New Rules of the Road," *The Wall Street Journal*, 22 December 2010. (available: <http://online.wsj.com/article/SB10001424052748703581204576033513990668654.html>. Accessed 3 November 2011).

¹¹ This is due to the bilateral system of international long-distance. While continuously evolving, it dates back to 1865. See International Telecommunication Union (2011: Chapter 6): <http://www.itu.int/osg/spu/intset/whatare/wtdr/wtdr.html>, (accessed 19 September 2011).

Governments in some countries may be better at regulating these costs than others. In some countries, telephone companies are simply state-owned enterprises. Alternatively, the state may regulate the industry by auctioning licenses for Global Systems for Mobile communications (Spicer 1996). Regulation also includes anti-trust action, such as when the US government took action against AT&T in the 1980s and more recently challenged its merger with T-Mobile.¹² Many have suggested that the regulation of privatized firms is superior to public provision (see, for example, Buchanan and Tullock 1962: 205-206).¹³ We do not seek to explain, however, the best approach that governments should use. Instead, we simply argue in the next section that democracies have stronger incentives than dictatorships to push prices lower.

3. Why prices are lower for democracy and higher for dictatorship

The effectiveness of the state in lowering prices through regulating the telephone industry may depend on incentives shaped by political regime. Governments that survive in office by winning contested elections – democracies – have incentives to provide public goods, such as effective regulation of the telephone industry’s naturally monopolistic technology.

¹² See, for example, “A.T.&T., US Agree on Final Aspects of Bell Breakup,” *New York Times*, 4 August 1983 and “US Moves to Block Merger Between AT&T and T-Mobile,” *New York Times*, 31 August 2011 (accessed 19 September 2011).

¹³ On the optimal size of the public sector, see Barro (1990). For a more recent contribution, see Bernauer and Koubi (2011).

Governments that survive in office by providing benefits to a small but loyal “winning coalition” – autocracies – may favor profits for telephone monopolies, allowing them to charge higher rates (Bueno de Mesquita et al. 2003). Moreover, autocracies have incentives to reduce communication of the outside world with their citizens.

Consider, first, the classic model of Peltzman (1976), which formalizes the theory of regulation of Stigler (1971). In the model, there are essentially three actors: the government or “state,” the monopolist, and the consumers. The monopolist and the consumers care mainly about the price of the regulated good (in our case, international long-distance), while the state cares about maximizing political support from the monopolist and the consumers. Peltzman assumes that “the powers of the state are sufficient to, on the one hand, enforce competition... and on the other, to ban the sale of the good or price it out of existence.” So any level of profits should generate some support from the monopolist, and any consumer surplus should generate some support from the consumers.

Without repeating all of the details of Peltzman’s mathematics, consider figure 1, which depicts the price-profit curve for a monopolistic technology. Profit, π , is modeled as a function of the price of the good (in this case, telephone service), p , and production costs, c : $\pi=f(p,c)$, with $f_p \geq 0$ and $f_{pp} < 0$, so that the profit curve has a single optimal value where $f_p=0$ (note that subscripts denote partial derivatives). More importantly for our discussion, the curves labeled M1, M2, and M3 represent political-support indifference curves. Political support, M , is increasing as one moves northwest in the figure, towards higher profits for the monopolist and lower prices for the consumer. Political support is

thus modeled as a function of p and π : $M=M(p, \pi)$. In figure 1, the government maximizes political-support by setting $p=p^*$, as this is the value of p where the indifference curve labeled M2 is tangent with the profit curve. (Points along M1 are dominated by this point, while M3 is unattainable.)

The major insight from this model is that neither party, the monopolist nor the consumer, is completely satisfied, and both have an impact on the government's decision of where to set the price for the regulated good. Rather than set the price at the monopolist's ideal point (p^{Dict}), which is what a government that is completely captured by the monopolist would do, or set the price at the consumer ideal point (p^{Dem}), which is what a government that is completely accountable to consumers would do, the government sets the price somewhere in between (p^* , in figure 1).

Note that the curvature of the indifference curves indicates the influence that the monopolist and the consumers both have on the government's survival. The flatness of the indifference curves indicates the strength of the monopolist in determining the political support enjoyed by the government, while the degree to which they curve vertically indicates greater influence of consumers in the government's survival.

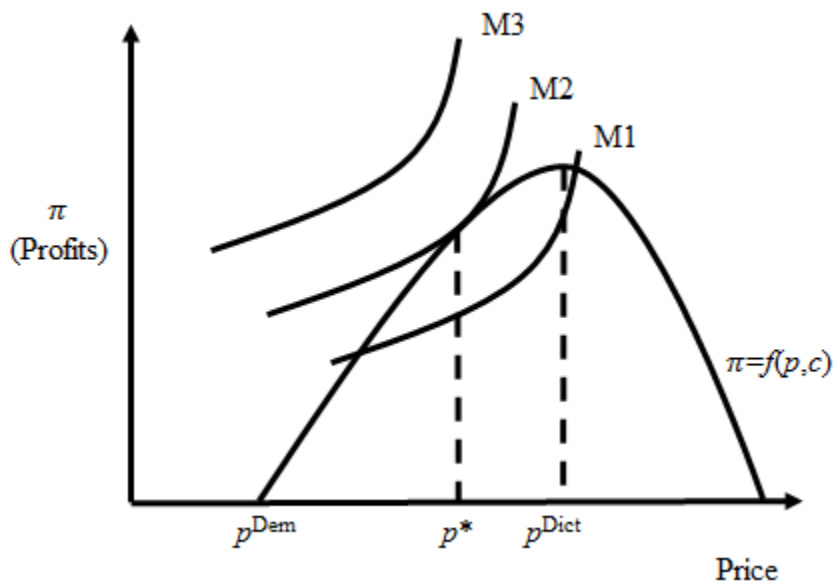
Peltzman does not delve deeply into the shape of the indifference curves, he assumes, following Stigler, that M is strictly increasing in p and strictly decreasing in π : $M_p < 0$, $M_\pi > 0$ (where subscripts again denote partial derivatives).¹⁴ Yet, one can imagine these indifference curves taking on different shapes under different political regimes.

¹⁴ See Przeworski (2003: 111).

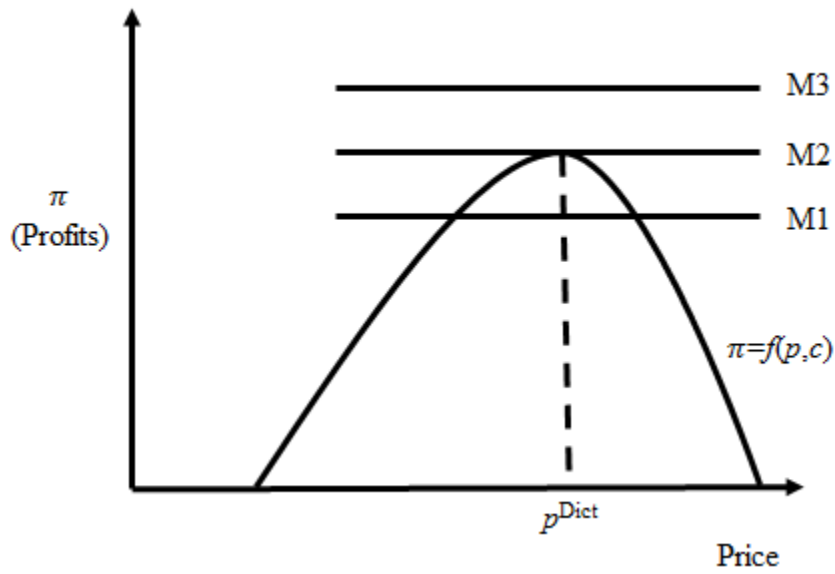
Consider, for example, “pure” types. For example, if consumers have zero impact on the survival of the government – a “pure” autocracy – the government would cater completely to the desires of the monopolist: $M_p=0$, $M_\pi>0$. Figure 2 illustrates such political-support indifference curves. Clearly, the government maximizes political support by setting $p=p^{\text{Dict}}$, as this is the value of p where the indifference curve labeled M2 is tangent with the profit curve. It is also the monopolist’s ideal point.

What about under “pure” democracy? If we assume $M_p>0$ but $M_\pi=0$, we have the opposite situation, where the monopolist has zero impact on government’s political support (see figure 3). The government thus sets $p=p^{\text{Dem}}$, as this is the value of p where the indifference curve labeled M2 is tangent with the profit curve. It is the ideal point of the consumers – the price under perfect competition. This point represents zero profits for the monopolist, or the “fair market” price for international long-distance.

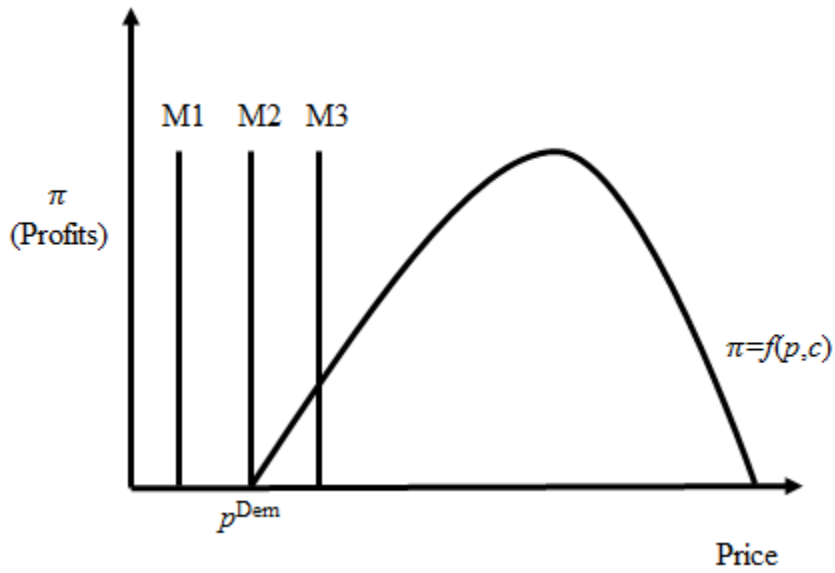
Figure 1: The Peltzman Model – Political support as a function of support from monopolist and consumers/voters



**Figure 2: “Pure” autocracy –
Political support depends entirely on the monopolist**



**Figure 3: “Pure” democracy –
Political support depends entirely on the consumers/voters**



The shape of the indifference curves in Peltzman's model thus represents different political institutions. Pure types may not exist – we certainly do not believe that democracies can reach $p=p^{\text{Dem}}$ – all governments are subject to lobbying by monopolists. Still, the degree of curvature indicates varying degrees of political influence belonging to monopolists and consumers. Under some regimes (autocracy), the government depends more on the monopolist, presumably because of the money he can provide, which the government can use to pay off supporters, and repress or mislead consumers. Under other regimes (democracy), the government depends more on the consumers, presumably because of the votes that they cast at election time. These governments seek to win re-elections by pursuing efficient economic policy.¹⁵

Now, if the public good in question is international long-distance, it is not obvious whose political preferences should prevail – under any regime. The direct consumer is, by

¹⁵ Regarding the influence of economic performance on winning elections, also see Hibbs (1982, 2000, 2008). On Regulation Theory and rent-seeking, in addition to Stigler (1971, 1975) and Peltzman (1976), see Tollison (1982), Dahl (1992), Spiller (1995), Baron (1995), Majone (1997), Sánchez-Cuenca (1997). For an overview, see Przeworski (2003: chapter 6). On political regime and rent-seeking, see, for example, Maravall (1994) and Adserà et al. (2003). For recent work on the provision of public goods under democracy, see Chang et al. (2011), Bättig and Bernauer (2009), Stasavage (2005). For a direct study of democracy, telecommunications, and economic growth, see Mattoo et al. (2001). A further approach would be to consider the globalization of international legal standards in regulation to address corruption – see Kaczmarek and Newman (2011).

definition, outside of the country. Most citizens travel abroad only occasionally, if at all. Recall, however, that the pricing mechanisms of international long-distance imply a dual effect on incoming and outgoing prices for any action taken. If it is more expensive for foreign customers to call into a country, it is consequently just as expensive for citizens to call out of the country.¹⁶ So, while it may seem plausible that every government would try to set the price as close to p^{Dict} as possible if the consumer were outside of the country, this action would also result in higher outgoing long-distance rates for its own citizens. Regimes that are more accountable to consumers (democracies) should be more sensitive to this fact and thus pursue policies that lower the cost of international long-distance rates. Moreover, citizens benefit indirectly from lower incoming long-distance prices: On the margins, they receive more calls from abroad. Lower transaction costs for doing international business result in greater efficiency for the overall economy and may thus be thought of as a public good.¹⁷ Following Bueno de Mesquita et al. (2003), we expect

¹⁶ Changes in one country's telecommunications network affect both incoming and outgoing traffic. See International Telecommunications Union (2011).

¹⁷ It would be interesting in further research to apply the Heckscher–Ohlin and Stolper–Samuelson theorems to see if countries where the “winners” from international business transactions have political power also have the lowest long-distance rates. Usually, of course, these theorems are applied to trade. For a recent application to another related area, immigration, see Mayda (2006).

democratic governments to be incentivized to provide the public good, while authoritarian governments to be more subject to capture by the monopoly.¹⁸

Now, under democracy, it is easy to imagine that the typical consumer might be the median voter. Under dictatorship, however, it is not clear who the consumer is. If the main consumer of international long-distance is the state, for example, the degree of collusion between the monopolist and the state to keep prices high is not obvious. The telephone monopolist may also be the state, in some cases. Still, while the relationships between the state, the monopolist, and the consumer may be ambiguous under dictatorship – introducing “noise” – it is more systematic under democracy. So, on average, we expect democracy to be less expensive.

And dictatorships have a further reason to allow international long-distance prices to be high: On the margins, increasing the cost to call a country reduces communication between its citizens and the rest of the world. As illustrated by countless recent events in China and by the Arab Spring, authoritarian regimes often seek to limit exposure to the rest of the world. Failing to do so can have disastrous consequences. Democracies, by contrast, value openness and, typically, global transactions (see, e.g., Russett and Oneal 2001).

Authoritarian governments face a trade-off between promoting economic efficiency through improved telecommunications and the loss of political control (Kedzie

¹⁸ The logic is also related to arguments about democracy and free trade (see Mansfield et al. 2000 and Gowa and Mansfield 1993).

1997). Chase and Mulvenon (2002) detail this trade-off for the case of China and the spread of the Internet. They conclude that the state has effectively prevented Internet communication from threatening the regime. In another study of China, Weiss (2008) documents how the state regulates mobile phone communication to shape, control, and shut-down political movements. In their study of the spread of Internet communication in eight autocracies, Kalathil and Boas (2002) show that the state controls the content.¹⁹ In her broad study of Internet access around the world, Milner (2006) shows that dictatorships hinder the spread of Internet service relative to democracies.²⁰

When it comes to international long-distance, we do not suggest that keeping the price of calling into an autocracy represents the same kind of political control as more direct actions, such as shutting down mobile phone grids or censoring Internet content. With international long-distance, control is on the margins. Higher prices translate into fewer and shorter calls that the citizens of autocracies receive, in the aggregate. Considering that the breakdown of autocratic regimes is a relatively rare event, such slowing down of communication may be a sufficient policy to maintain political control

¹⁹ Also see Kedzie (1997), Lessig (1999), Guillen and Suarez (2001), Norris (2001), Oxley and Yeung (2001), Wilson (2004), Boas (2006), Newman and Zysman (2006), and Deibert et al. (2010).

²⁰ See, however, the recent study of Shapiro and Weidmann (2011), who show that allowing for telecommunications may be one way to connect with potential informants. Note that while this provides governments with incentives to encourage people to call out, it may not provide incentives to allow outsiders to call in.

while still allowing for the necessary contact for international economic transactions. The policy is likely not explicit. Rather, autocratic governments simply face different incentives, which run in the opposite direction of those facing democratic governments. The upshot is that we should be able to detect a marginal difference between international long-distance pricing across political regimes. We thus hypothesize a discount for calling democracies.

4. Data, methods, results

Data

The cost of international long-distance reflects, of course, the costs in both countries. We address this by measuring the cost to call into a country from a “basket” of countries – the Average Revenue Per Minute (ARPM) generated by various telecoms – which approximates the world price. This measure is the industry standard. We then consider, for robustness, the cost calling from a neutral democracy (Switzerland) and an advanced industrialized authoritarian country (Singapore). Our dataset is a cross-section for the year 2010 including (a maximum of) 156 countries. The ARPM data captures the behind-the-scenes rates available on the wholesale market, whereas the Swiss and the Singaporean data are the tariffs to outside countries for calls originating in Switzerland and Singapore, respectively.

The ARPM data come from Global Wholesale Tracker, which aggregates and reports the transactions on the wholesale market for 16 telecommunications companies.²¹ The ARPM is calculated by summing the revenues for all 16 telecoms for all calls that terminated in a specific country, divided by the sum of the corresponding minutes for those revenues, thus yielding an average revenue per minute. It is important to emphasize that, while most of the telecommunications companies included in the ARPM basket are headquartered in advanced industrialized democracies, their subsidiaries work in many countries. For example, Telenor is headquartered in Norway but is also a provider in Bangladesh, Denmark, Finland, Hungary, India, Malaysia, Montenegro, Pakistan, Serbia, Sweden, and Thailand. These specific data capture the total revenue and total minutes by terminating-country for aggregate activity in the global wholesale market for September 2010. Given the geographic breadth of these 16 carriers, the market share they possess, and the ability to route traffic through third and fourth countries, the ARPM data approximate a “world” price to make a call that terminates in each country.

As tests of robustness, we also employ the rate charged by a low-cost provider to call each country from Switzerland and the most widely used mobile provider in

²¹ AT&T (United States), Bharti Airtel (India), BICS (Belgium), BT (United Kingdom), CITIC (Hong Kong), France Telecom (France), iBasis (headquartered in the United States, but controlled by a Dutch company), Jazztel (Spain), KDDI (Japan), Sprint (United States), Tata Communications (India), Telecom Italia (Italy), Telefonica (Spain), Telekom (Malaysia), Telenor (Norway), Verizon Wireless (United States). See <https://www.gwtracker.com/index.aspx>, (accessed 15 November 2010).

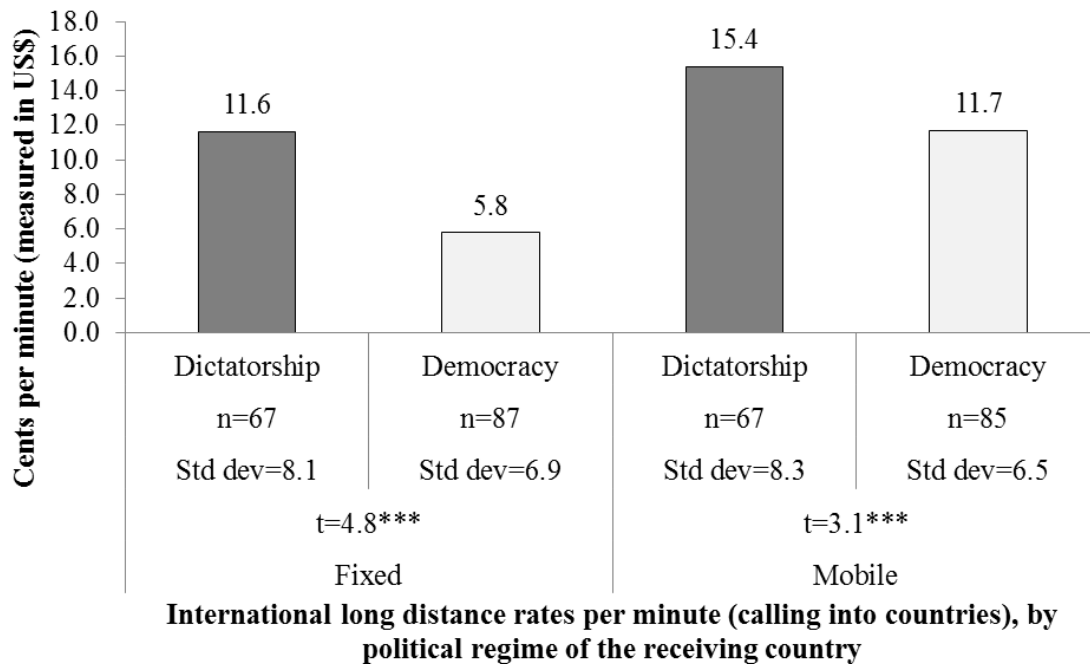
Singapore. We use Switzerland as a base country because Switzerland is famously neutral, so there should be no legal restrictions on transactions between its citizens and the citizens of autocracies. We use the rate charged by Lebara, a low-cost provider, to call countries from mobile phones in Switzerland to, alternatively, mobile and fixed-line phones. Singapore represents an economically advanced and internationally integrated autocratic country, with Singapore Telecommunications Limited (SingTel) as the most well-known mobile telecommunications provider.²²

For our principal independent variable, we employ a minimalist definition of democracy. Following Schumpeter (1942) and more recently Przeworski et al. (2000), we define democracy as a political system in which key government offices are filled through contested elections. The definition has two parts: “key government office,” defined as the executive and the legislature; and “contested,” which implies that more than one party has some probability of winning office through election. Following this definition, Cheibub et al. (2010) code 89 countries as democracies in our sample and 67 as dictatorships for the year 2009.

Consider what we observe. Figure 4 presents the descriptive relationship between long-distance rates and political regime by means of a t-test.

²² We thank Daniel Yew Mao Lim for this information about Singapore.

Figure 4: Average Revenue Per Minute by regime type



The ARPM for calls to fixed lines averages 11.6 cents for dictatorships, while the rate for democracies averages 5.8 cents. The difference of 5.8 cents is statistically significant at the one percent level, according to a simple t-test. For calling mobile phones, the average rate for authoritarian regimes is 15.4, while the rate for calling democracies is 11.7. The difference of 3.7 cents is, again, statistically significant at the one percent level, according to a simple t-test. Interestingly, the difference is smaller for mobile phones, which may indicate that political regime has less influence over this newer technology – perhaps because it is still naturally more competitive with multiple providers in most markets.

The relationship between political regime and international long-distance rates suggested by the figures above may, of course, be driven by other factors. Telecommunications technologies are naturally monopolistic precisely because of

increasing returns to scale: The marginal cost of providing service declines with the number of consumers. So, perhaps the most obvious and important control variable is per capita income. Democracies are, on average, richer than dictatorships, and thus typically have a more sophisticated telecommunications infrastructure, which can lead to lower rates.²³ To account for this, we control for GDP per capita measured in terms of purchasing-power-parity.²⁴ Countries with a larger consumer-base should also experience the effect of economies of scale, so we control for population size. It is not obvious if a territory has an effect – it may make monopolies more likely. Countries that are more engaged in international transactions may also invest more in telecommunications, so we control for international trade, foreign direct investment, and remittances. The degree of urbanization and the geographical size of a country may also play roles. The size of the overall network of callers – beyond national borders – may also bring the price down, so we control for the following linguistic groups: Mandarin, French, German, Persian,

²³ On the relationship between income and regime, see Przeworski et al. 2000, Boix and Stokes 2003, Boix 2003, Epstein et al. 2006, Acemoglu and Robinson 2006, Acemoglu et al. 2008, Rosendorff 2001, Quinn 2009, Crespo et al. forthcoming, and Gassebner et al. forthcoming.

²⁴ Alternatively, we also control for the development of the telephone industry directly using the number of mobile and fixed lines (Due to the high correlation between GDP per capita and telephones per capita, estimations including both measures suffer from multicollinearity.) These results are available on request and are included in the replication materials.

Portuguese, Romanian, Russian, Arab, Spanish, Swedish, English, and multi-lingual countries. Not reported, but available on request and with the replication materials, we also control for a full set of geographic region control variables as a further check. In the interest of space, we include in the results that we present only regions that we have found to be systematically different from the rest of the world – notably Africa (which is more expensive) and Asia (which is less expensive). We also find Europe to be systematically less expensive for the Swiss.²⁵

Note that most research in international political economy assumes diminishing returns to scale and thus takes the natural logarithm of some of the above variables (specifically, per capita income, population, and geographical size). It is not obvious, however, that such approaches are the appropriate course here. Our dependent variable is generated by a technology with increasing returns to scale, so we actually do not expect diminishing effects from size. One might even argue that the quadratic or cubic form of these variables is appropriate. The best fit for these control variables is beyond the scope of our study on the effect of political regime. Thus in the main specifications, below, we employ the linear form of the variables. We note that all of our results hold qualitatively using the natural logarithmic and the quadratic forms of these variables.²⁶

²⁵ Many of the control variables discussed above are suggested by the seminal study of Lake and Baum (2001). Also see Baum and Lake (2003).

²⁶ These results are available on request and with the replication materials. The only caveat is that the effect of political regime using the Singapore data is not as strong using

For the Swiss regressions below, we also control for unique aspects about Switzerland's economic and social profile: Swiss trade flows (imports plus exports), bilateral foreign aid from Switzerland, immigration to Switzerland, and remittances from Switzerland.²⁷ These variables are not widely available for the case of Singapore, except for trade flows, which we do include. The descriptive statistics for all of the variables mentioned above are available in Table 1a of the appendix.

Method

Our dataset includes five measures of international long-distance: (1) mobile ARPM, (2) fixed-line ARPM, (3) Swiss mobile rates (Lebara), (4) Swiss fixed-line rates (Lebara), and (5) Singaporean fixed-line rates (SingTel). We use regression analysis to determine the effect of regime type on international-long-distance rates. We begin by including the economic and demographic control variables, then we add, alternatively, the control variables for language groups and region. Most of the control variables turn out to be irrelevant in multiple specifications that we have tried, and if we include them all together in one specification, the level of inefficiency renders our results meaningless. Instead, we

the natural logarithm of trade flows. As shown below, they are strong using the linear control variables; they also hold using the quadratic form of the control variables.

²⁷ We also wished to control for Swiss foreign direct investment stock abroad, but sufficient data are not available.

present a third specification for each dependent variable that includes all variables that we have found to have a statistically significant effect in the previous models.

Results

We begin our analysis with the fixed-line ARPM rates. Models 1-3 in table 1 show that democracy has a negative and statistically significant correlation with fixed-line long-distance. The significance holds when we include economic, linguistic, and regional control variables. Our preferred specification, where we include all statistically significant control variables (model 3), suggests that it is less expensive to call democracies by 3.3 cents per minute. We can say, with 95 percent confidence, that the effect is between 1.2 and 5.3 cents per minute (not reported). Considering that the average fixed-line rate is 8.3 cents per minute, the 95 percent confidence interval suggests that the democracy-discount is between 14 and 64 percent.

Turning to the mobile ARPM rates, models 4-6 in table 1 show that democracy again has a negative and statistically significant correlation with long-distance rates. The statistical significance holds controlling for economic, linguistic, and regional factors. Our preferred specification, where we include all statistically significant control variables (model 6), suggests that it is less expensive to call democracies by 2.6 cents per minute. We can say, with 95 percent confidence, that the effect is between 0.4 and 4.7 cents per minute (not reported). The average ARPM for mobile calls is 13.3 cents per minute. So,

the 95 percent confidence interval suggests that the democracy-discount is between 3 and 35 percent.

Table 1 here

Consider some examples. Argentina and Latvia are democracies with per capita income of roughly \$13,000. The fixed-line ARPM is 0.8 and 2.5 to call each of these countries, respectively. Meantime, in autocratic Gabon, also with per capita income of about \$13,000, the fixed-line ARPM is 13; in Libya, with per capita income over nearly \$15,000, the ARPM is 18.7; in Iran, with per capita income of about \$10,000, the fixed-line ARPM is 6.2. Turning to mobile rates, calling democratic Turkey, a country with per capita income of about \$11,000 costs about 4.4 ARPM; calling autocratic Kazakhstan, a country with per capita income of about \$10,000 costs nearly double: 8.5 ARPM. Now, when we re-analyze our data focusing on the poorest of countries, we do not find a statistically significant effect of regime, which echoes the findings of studies that focus on state capacity – in destitute countries, the state does not have much effect.²⁸ Focusing on middle and upper income countries, however, our findings hold – indeed the magnitude of the effect increases. For middle and upper income countries, the variance of long-

²⁸ See Keefer 2008, and, of course, Ross (2006). For related studies, see Navia and Zweifel (2003) and Pande (2003). In an important new contribution, Hanson (2010) argues that state capacity may be a substitute for democracy in the provision of public goods. Kayser and Blaydes (2011) contend that democracies and hybrid regimes can help the poor by converting economic growth into calorie-consumption.

distance pricing is highly correlated with political regime, and democracy exerts a substantively and statistically significant cost-reducing effect.

The analysis of the data from Switzerland and Singapore broadly confirms the above results (see tables 2 and 3). The statistically significant negative effect of democracy on long-distance holds controlling for economic, linguistic, and regional factors. In our preferred specification for Swiss fixed-line rates, the effect is estimated to be -7.1 CH centimes per minute (95 percent confidence interval: -2.7 to -11.6).²⁹ For Swiss mobile rates, the estimated effect is -6.1 U.S. Cents³⁰ per minute (95 percent confidence interval: -2.1 to -10.2). For Singaporean mobile rates, we estimate an effect of -19.7 SGD cents per minute (95 percent confidence interval: -1.5 to -28.8).³¹ The point estimates suggest democracy-discounts of 27, 17, and 12 percent, respectively.

Table 2 here

Table 3 here

²⁹ This coefficient amounts to -7.2 US cents per minute using the exchange rate of 1 CHF: 1.0023 USD. Source: Swiss Central Bank, September 2010. Source: <http://www.snb.ch/ext/stats/akziwe/pdf/defren/Devisenkurse.pdf>.

³⁰ This coefficient rounds off to -6.1 US cents using the same exchange rate as above.

³¹ This coefficient amounts to -15.2 US cents per minute using the exchange rate of 1.3003 Singapore Dollars to 1 USD. Source: Monetary Authority of Singapore, September 2011. <http://secure.mas.gov.sg/msb/ExchangeRates.aspx>.

Before moving to a discussion of the control variables, we note that the rates in Switzerland and, especially, Singapore, are more expensive than the world average. This is consistent with the contentions that (1) long-distance is a function of both the calling and the receiving countries, and (2) smaller countries have higher rates due to economies of scale. The fact that the Singaporean rates are so substantially more expensive than the ARPM and the Swiss rates is consistent with our overall argument, as Singapore has an authoritarian political regime. This may depress the effect of political regime, which is statistically significant but substantively smaller using the Singaporean data. The country-specific differences suggest that a full dyadic analysis might be fruitful, although such a dataset is not currently available. While the Swiss and Singaporean findings lend confidence, we emphasize and place more confidence in the ARPM “world price” results.

Concerning the control variables, most of them have the expected effects. Per capita income has a statistically significant negative effect on the world price and the rates charged in Singapore; surprisingly, the negative effect is not statistically significant for Swiss rates. Population also has the expected negative effect throughout, though it is not statistically significant for the Swiss or Singaporean rates. Urbanized countries are less expensive to call from Switzerland, but do not appear to have systematic differences for the world price or Singaporean rates. The highly trade-dependent Singapore does exhibit systematically lower rates for trade partners, which is not surprising given the priorities of the government. Trade has negative but non-significant effects for the world and Swiss prices. Foreign direct investment, remittances, and land area appear to have no systematic effects. Calling from Switzerland to countries with large numbers of

immigrants to the neutral country is less expensive. This is likely not due to public policy, but rather a strategy of our particular company: Lebara Mobile markets itself as a low-cost international phone service for migrant communities. As stated in the introduction, calls to Africa are more expensive, while calls to Asia are less expensive, perhaps reflecting the respective levels of development and strength of export-sector lobbies. This is consistent with the only major linguistic group findings: French-speaking countries (mainly in Africa) are more expensive to call, while Mandarin-speaking countries (China, Hong Kong, and Singapore) are less expensive. We also find evidence that it is less expensive to call Europe from Switzerland; it is not obvious if this is due to region, a marketing strategy of Lebara, or both.

5. Conclusion

Does the cost of calling someone across a border depend on the political institutions in the receiving country? Governments that depend on winning the votes of consumers to survive in office have incentives to regulate monopoly pricing more effectively. Governments that survive through repression survive in office have incentives to limit the communication of their citizens with the rest of the world. Applying these two arguments to the international long-distance telecommunications market, we test whether it is less expensive to call democracies than dictatorships. We estimate a democracy-discount of about 19 percent of the average cost per minute for mobile telephone calls, and about 39 percent for calls to fixed lines.

A limitation of our study is the availability of data. We test our theory using a cross-section of data for 2010. It would be interesting to expand the dataset across time to test how quickly a democratically elected government can lower prices following a transition.³² It would also be useful to expand the dataset “dyadically” to evaluate the effect of regime across pairs of democracies, pairs of autocracies, and mixed pairs. Our study begins to address this by testing the industry-standard average originating or “world” price from a basket of global companies, covering all 156 countries – including 89 democracies and 67 dictatorships – as receiving countries. Our robustness tests analyze data for calls originating in a neutral democracy and an advanced industrial autocracy (Switzerland and Singapore, respectively), and confirm our main conclusions. They further suggest that a focus on prices for originating countries would be a fruitful companion to our study of prices for destination countries.

Recalling the old advertising campaign of “Ma Bell,” we note that the cost to “reach out and touch someone” in a democratic country is significantly lower than reaching out to someone living under a dictatorship. In 2011, while the United States took action to keep the cost of telecommunications low by preventing the merger of AT&T and T-Mobile, protesters in the Middle East listed the high cost of telecommunication as one of the many discontents with their governments. Considering the role that the diffusion of information played in the Arab Spring, this might be by design. Autocratic governments may, on the margin, prefer less communication for their citizens with the

³² For a qualitative analysis of telecommunication reforms in Mexico, see Mariscal (2004).

rest of the world. The implications for domestic politics were illustrated as news of protests travelled throughout the Arab world in 2011. Under democracy, the incentives cut in the other direction, with governments seeking economic efficiency without regard to loss of political control. The implications for international political economy should also be noted. Considering the rate at which economic transactions take place globally – currently estimated to be over one trillion dollars per day (Oatley 2011) – and the role that communication plays in these transactions, our study indicates that the spread of democracy would improve global economic efficiency. Democracy is good for cross-border communication in a very real sense: it lowers the price.

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Appendix

Table 1a: Descriptive data and sources

Variable	Mean	Std. Dev.	Min	Max	Units	Source
ARPM Fixed	8.34	7.96	0.6	34.5	Cents (USD, 2010)	Global Wholesale Tracking Service (2010)
ARPM Mobile	13.32	7.56	0.8	34.5	Cents (USD, 2010)	Global Wholesale Tracking Service (2010)
Lebara Fixed	26.75	16.19	5	89	Swiss centimes per minute	Lebara Mobile (2010)
Lebara Mobile	35.10	14.14	8	89	Swiss centimes per minute	Lebara Mobile (2010)
Singtel Mobile to fixed lines	159.06	65.44	13	381	1 minute long-distance in SGD cents	Singapore Telecommunications Limited (2011)
Democracy	0.57	0.50	0	1	Indicator variable	Cheibub et al. (2010)
GDP/capita (PPP)	11.88	13.43	0.29	82.98	Thousands of const. 2005 PPP\$	World Bank (2010)
Population	42.50	144.73	0.32	1331.46	Millions (2009)	World Bank (2010)
Population, % Urban	56.60	22.58	10.7	100	Percent of land area	World Bank (2010)
Land Area (sq. km)	0.82	2.03	0.0003	16.38	Millions of sq km	World Bank (2010)
Trade, % of GDP	82.28	43.14	22.30	380.49	Imports plus exports, percentage	World Bank (2010)
Swiss trade	23.53	97.75	0.002	1006.34	Imports plus exports, hundred millions of USD (2008)	United Nations (2011)
Singaporean trade	53.03	135.71	0.02	790.50	Imports plus exports, hundred millions of USD (2008)	United Nations (2011)
FDI, % of GDP	2.95	4.01	0	26.33	Percentage	World Bank (2010)
Remittances, % of GDP	2.55	3.47	0.002	15.08	Percentage	World Bank (2010)
Immigrants to Switzerland	9.77	31.17	0.014	247.93	Thousands, stock	Parsons et al. (2005) & Ratha & Shaw (2007)
Swiss aid	7.33	16.03	0	158.94	Millions of current US \$ (2009)	World Bank (2010)
Africa	0.28	0.45	0	1	Regional indicator variable	Marshall & Jagers (2002)
Asia	0.17	0.38	0	1	Regional indicator variable	Marshall & Jagers (2002)
Europe	0.26	0.44	0	1	Regional indicator variable	Marshall & Jagers (2002)
Arabic	0.103	0.30	0	1	Language indicator variable	Goldstein et al. (2007)

English	0.154	0.36	0	1	Language indicator variable	Goldstein et al. (2007)
French	0.103	0.30	0	1	Language indicator variable	Goldstein et al. (2007)
German	0.013	0.11	0	1	Language indicator variable	Goldstein et al. (2007)
Mandarin	0.019	0.14	0	1	Language indicator variable	Goldstein et al. (2007)
Multi-lingual	0.038	0.19	0	1	Language indicator variable	Goldstein et al. (2007)
Persian	0.013	0.11	0	1	Language indicator variable	Goldstein et al. (2007)
Portuguese	0.026	0.16	0	1	Language indicator variable	Goldstein et al. (2007)
Romanian	0.013	0.11	0	1	Language indicator variable	Goldstein et al. (2007)
Russian	0.019	0.14	0	1	Language indicator variable	Goldstein et al. (2007)
Spanish	0.115	0.32	0	1	Language indicator variable	Goldstein et al. (2007)
Swedish	0.013	0.11	0	1	Language indicator variable	Goldstein et al. (2007)

Table 1: The effect of democracy on international long-distance – Average Revenue Per Minute (ARPM)

Variable	ARPM Fixed			ARPM Mobile		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Democracy	-2.90** (1.39)	-2.92** (1.31)	-3.26*** (1.05)	-2.63* (1.53)	-2.33* (1.38)	-2.56** (1.09)
GDP/capita (PPP)	-0.25*** (0.076)		-0.12*** (0.041)	-0.19** (0.088)		-0.092** (0.044)
Population	-0.0073* (0.0042)		-0.0058 (0.0036)	-0.011** (0.0046)		-0.0078** (0.0037)
Population, % Urban	-0.043 (0.039)			0.037 (0.043)		
Trade, % GDP	-0.014 (0.017)			-0.020 (0.019)		
FDI, % GDP	0.18 (0.23)			0.13 (0.25)		
Remittances, % GDP	0.050 (0.18)			-0.0053 (0.20)		
Land area (sq. km)	-0.33 (0.35)			-0.50 (0.41)		
Africa		8.99*** (1.62)	6.25*** (1.31)		4.09** (1.75)	3.23** (1.36)
Asia		1.23 (1.60)			5.27*** (1.70)	-6.13*** (1.50)
Mandarin		-7.56* (3.85)	-2.36 (3.92)		-8.81** (4.06)	
French		4.46** (2.01)	5.38*** (1.73)		1.94 (2.13)	
German		-3.08 (4.44)			-4.37 (4.69)	
Persian		3.69 (4.49)			1.14 (4.74)	
Portuguese		-6.11* (3.21)			-4.50 (3.39)	
Romanian		1.72 (4.44)			-2.47 (4.69)	
Russian		-2.34 (3.68)			-3.56 (3.89)	
Arabic		1.90 (2.04)			0.92 (2.15)	
Spanish		0.099 (1.77)			-2.20 (1.87)	
Swedish		-2.23 (4.44)			-6.52 (4.69)	
English		-1.48 (1.62)			-0.24 (1.76)	
Multi-lingual		-3.94 (2.93)			-4.90 (3.46)	
Constant	15.7*** (2.45)	7.30*** (1.40)	9.52*** (1.06)	16.8*** (2.69)	15.0*** (1.48)	16.2*** (1.25)
Observations	116	154	149	115	152	147
R-squared	0.357	0.469	0.489	0.191	0.346	0.329
Log Likelihood	-373	-489	-470	-381	-490	-473

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2: The effect of democracy on international long-distance – Lebara rates from Switzerland

Variable	Lebara Fixed			Lebara Mobile		
	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Democracy	-6.46** (2.97)	-5.74** (2.83)	-7.13*** (2.25)	-6.26** (2.70)	-6.16** (2.60)	-6.13*** (2.04)
GDP/capita (PPP)	-0.30 (0.40)			-0.28 (0.36)		-0.081 (0.080)
Population	-0.020 (0.016)			-0.018 (0.014)		-0.013 (0.0078)
Population, % Urban	-0.23** (0.093)		-0.18*** (0.051)	-0.067 (0.085)		
Swiss trade	-0.039 (0.29)			-0.24 (0.27)		
Swiss aid	-0.0086 (0.088)			-0.030 (0.080)		
Immigrants to Switzerland	-0.16* (0.092)		-0.067* (0.035)	-0.044 (0.083)		
Land area (sq. km)	-0.48 (1.80)			0.76 (1.63)		-0.88* (0.52)
Europe		-11.1*** (4.18)	-7.40*** (2.72)		-4.77 (3.84)	
Africa		13.4*** (4.19)	7.82*** (2.73)		10.1*** (3.84)	9.37*** (2.37)
Asia		-0.65 (4.46)			-5.25 (4.09)	
Mandarin		-23.8*** (8.23)	-21.0** (8.92)		-26.9*** (7.54)	-19.2** (7.64)
French		-5.66 (4.34)			-3.89 (3.98)	
German		-9.21 (9.53)			-6.38 (8.74)	
Persian		1.25 (9.70)			0.81 (8.90)	
Portuguese		-13.9** (6.91)	-7.99 (6.35)		-12.6** (6.33)	-7.51 (5.84)
Romanian		6.29 (9.53)			-3.88 (8.74)	
Russian		-1.35 (7.89)			-6.00 (7.23)	
Arabic		0.71 (5.11)			-1.44 (4.68)	
Spanish		-4.78 (4.85)			-1.44 (4.44)	
Swedish		-7.21 (9.53)			-3.88 (8.74)	
English		-9.05** (3.55)	-6.18** (2.92)		-3.43 (3.26)	
Multi-lingual		-8.08 (5.77)			-11.5** (5.29)	-7.41 (4.84)
Constant	49.9*** (4.44)	33.1*** (4.10)	42.7*** (3.53)	47.3*** (4.03)	40.8*** (3.76)	38.7*** (2.08)
Observations	96	156	153	96	156	151
R-squared	0.281	0.416	0.459	0.225	0.356	0.362
Log Likelihood	-387	-613	-596	-377	-600	-576

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3: The effect of democracy on international long-distance – SingTel from Singapore

Variable	Singtel Mobile to fixed lines		
	Model 13	Model 14	Model 15
Democracy	-25.0** (9.95)	-21.7* (11.4)	-19.7** (8.96)
GDP/capita (PPP)	-1.87*** (0.41)		-1.57*** (0.34)
Population	-0.047 (0.034)		
Population, % Urban	0.16 (0.27)		
Singaporean trade	-0.23*** (0.040)		-0.19*** (0.035)
Land area (sq. km)	-0.088 (2.28)		
Europe		-24.7 (16.7)	
Africa		35.9** (16.6)	6.64 (13.9)
Asia		-61.7*** (17.6)	-56.0*** (12.4)
Mandarin		-110*** (38.8)	0.31 (32.6)
French		-41.3** (17.2)	-22.7 (18.1)
German		-120*** (37.7)	-96.6*** (28.9)
Persian		-18.3 (38.4)	
Portuguese		-15.6 (27.3)	
Romanian		129*** (37.7)	13.6 (39.7)
Russian		48.7 (31.2)	
Arabic		-10.0 (20.3)	
Spanish		10.5 (19.2)	
Swedish		-67.2* (37.7)	-60.9** (28.8)
English		-42.1*** (14.0)	-21.2* (12.1)
Multi-lingual		-42.9* (22.8)	-76.4*** (20.9)
Constant	195*** (15.0)	193*** (16.3)	211*** (9.70)
Observations	106	154	106
R-squared	0.551	0.442	0.701
Log Likelihood	-554	-817	-532

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1