CREATIVE DESTRUCTION IN THE INTERNET ECONOMY: 
THE INTERNET’S IMPACT ON ENTERPRISE VALUATION*

Extended Version of Article Published in Communications & Strategy, Special Issue: From the Net to 

Paul M. Vaaler
Assistant Professor of International Business 
&

Lee W. McKnight
Associate Professor of International Communication

The Fletcher School of Law & Diplomacy
Tufts University
Packard Avenue
Medford, MA 02067
USA
Tel (617) 627-2775 (McKnight)
Tel (617) 627-2243 (Vaaler)
Fax (617) 627-3712
Email lee.mcknight@tufts.edu
Email paul.vaaler@tufts.edu

*The authors thank Gonzalo Figuera, Isaac Fox, Raul Katz, Banu Ozcan, Burkhard Schrage and Michael
Watkins for their assistance, comments, suggestions, and/or co-authorship of earlier versions of this work.
Related publications include Ozcan et al. (2001) and Fox et al. (2002) We gratefully acknowledge
support for this research provided by the Fletcher School of Law & Diplomacy’s Edward R. Murrow
Center for International Communications, the Fletcher School of Law & Diplomacy’s Hitachi Center for
Technology & International Affairs, Booz-Allen & Hamilton, Inc., and the MIT Internet and Telecoms
Convergence Consortium.
CREATIVE DESTRUCTION IN THE INTERNET ECONOMY:
THE INTERNET'S IMPACT ON ENTERPRISE VALUATION

Abstract

How will the Internet change the metrics and methods for enterprise valuation, whether of new Internet business model-based firms, or more traditional enterprises confronting new entrants, new technologies, and hence new risks and opportunities? In previous research by the authors and others, fundamental economic, technical, and policy characteristics of the Internet economy, and of Internet businesses, have been analyzed. This article addresses the critical questions for determining how to assess the viability of businesses in the Internet economy, focusing particularly on the case of the privatization of telecommunications service providers in emerging markets.

Though the last two decades have seen substantial research in business, finance, economics and public-policy on enterprise privatization, there is surprisingly little research examining enterprise valuation. In the case of state-owned telecoms undergoing privatization in so-called emerging-market countries, privatizing asset valuation may be subject to substantial variability due to country-, industry- and enterprise organizational-contingencies. In addition, Internet-related contingencies which lower traditionally high barriers to entry in the industry, destroy traditionally lucrative market niches for incumbent telecoms, and create new opportunities for “Internet-agile” entrants whether or not governments sanction their activities, must also be factored into the valuation.

This article provides a framework for identifying and analyzing these contingencies. The article then develops a contingent model for appraising the fundamental value of state-owned enterprises undergoing privatization in emerging-market countries as well as undergoing assault from Internet-related forces of creative destruction. We then illustrate the model’s usefulness with an application to one recent instance of attempted enterprise valuation and privatization, that of Turkey’s national telecommunications enterprise, Turk Telekom. We conclude with a discussion of the private managerial and public policy implications of applying this contingent fundamental valuation model more broadly in the Internet economy.
I. INTRODUCTION

What are the implications of the Internet for enterprise valuation, whether of new Internet business model-based firms, or more traditional enterprises confronting new entrants, new technologies, and hence new risks and opportunities? Academic researchers, market analysts, business strategists, policymakers, and casual observers alike of the turbulent Internet economy may readily see why we posit in this article that firms seeking to establish themselves in the emerging Internet marketplace may share some characteristics with firms in developing countries. To systematically assess the risks and opportunities posed by the gales of creative destruction originating in the Internet economy, this article develops a contingent model of fundamental enterprise valuation especially suited for emerging-market country contexts, and illustrates how Internet-related factors may be taken into account in this model. In future work, the model can be extended as a general purpose model for valuation of Internet enterprises, and other firms whose competitive enterprise is likely to be affected by Internet firms. In other words, we expect this model may prove to be useful for the valuation of practically every business worldwide.

In previous research by the authors, fundamental economic, technical, and policy characteristics of the Internet economy, and of Internet businesses, have been analyzed. It has been shown that the Internet has novel features which differentiate firms and services relying on the Internet from firms still based upon earlier generations of technology. (McKnight and Bailey, 1997) New markets in bandwidth and services can thereby be created, challenging traditional telecommunications firm structures, strategies, and pricing models. (McKnight and Lehr, 1998; Lehr and McKnight, 2000; McKnight and Boroumand, 2000) The consequences for public policymakers stemming from the Internet’s broad societal impact include the need to rethink traditional telecommunications and television regulation, as well as the challenge of how to treat new Internet services, which do not fit in the old regulatory models. (Neuman, McKnight, and Solomon, 1997; McKnight, Lehr, and Clark, 2001) Finally, the nature of Internet business models has been explored, and the reasons for their inherent dynamism and instability
explained. (McKnight, 2001) What remains unanswered, and is therefore addressed in this article, is what is the appropriate metric for valuing a firm in the Internet economy? To begin to address this question, prior work on the privatization of telecommunications service providers is extended in this article. (see Ozcan et al., 2001; Fox et al., 2002)

Clearly, the privatization of state-owned enterprises is one of the most important economic, political and social phenomena of the last two decades. Since 1980 governments worldwide have sold more than 1200 enterprises with assets worth more than $750 billion. 30 of the 24 largest offerings in the 1990’s have been privatizations (Megginson, 1998). Developing countries are increasingly affected by this trend. By the end of 1996, for example, revenues from the privatization of state-owned assets in non-OECD countries accounted for approximately 22% of total privatization revenues, up from 17% in 1990. It is expected that the first decade of the new century should see that percentage rise to more than 33% of annual revenues (Economist, 1997).

Burgeoning sales of state-owned assets coincided with increased academic and applied research on a broad range of privatization issues. Conceptual and empirical work covers everything from legal and constitutional reforms facilitating the privatization process (e.g., Acs and Fitzroy, 1994; Black et al., 1996) and public-policy considerations for deciding when and how to go forward with a privatization program (e.g., Feigenbaum and Hennig, 1994; International Finance Corporation, 1995) to post-privatization organizational governance and behavior (e.g., Duncan and Bollard, 1992; Boycko et al., 1994), organizational performance (Megginson et al., 1994; Boubarkri and Cosset, 1998; D’Souza and Megginson, 1999) and public welfare implications (e.g., Vickers and Yarrow, 1985; Galal et al., 1992).

Processes of valuing of privatizing enterprise assets up for sale have also received considerable attention from academic quarters. Conceptual analyses developed by Perotti (1995) and Boycko et al. (1996), for example, suggest that enterprise valuation is enhanced where governments retain a substantial though passively managed equity stake in firms, or where the equity sale involves a few large shareholders. Recent empirical research on the choice of privatization sale modalities—private placements versus initial public offerings, auctions versus negotiated sales, cash-based versus voucher-
based tenders—indicate that the choice of sale modalities have substantial impact on enterprise asset prices realized, particularly in so-called “emerging-market” countries. Emerging market countries may be defined here as industrializing countries with substantial economic growth, but only partially-developed domestic capital markets and financial institutional sectors.\(^1\) For example, Lopez-de-Silanes (1995), Hillion and Young (1996) find that auction processes in developed and emerging-market country privatizations skew enterprise valuations substantially, while Hingorani et al. (1997) find that sales in emerging-market countries based on the tender of vouchers rather than cash are correlated with initially-underpriced enterprise assets.

While important, these research streams underplay or completely ignore assessment of “fundamental” factors in enterprise valuation. This includes approaches to assessing the impact of country-, industry- and enterprise-specific-factors intrinsic to the enterprise appraisal process no matter the sale modalities eventually used to transfer enterprise ownership and control from state to private hands. Where researchers do touch on matters of fundamental enterprise valuation, they often make little distinction between their assessment in industrialized and developed versus emerging-market contexts. The main implication to draw here are that the fundamental valuation of enterprises is generalizable across such contexts and relatively mechanical, which, of course, it is not. What is needed for both academic and applied research are practical models for assessing fundamental enterprise value to complement models of enterprise valuation tied to the sale modalities employed to transfer assets from state to private sector.

The need for such models seems particularly acute in the case of telecommunications enterprises (“telecoms”) valuation. In this article, the term, telecoms, refers to large, integrated organizations offering an “end-to-end” range of local, long-distance and international voice, data and graphical image communications services as well as related telecommunications equipment manufacturing and sales services. These privatizing enterprises face a number of challenges related largely to Schumpeterian

\(^1\) The term “emerging-market” may be used interchangeably with such terms as “emerging economy” or “transition economy.” For detailed explanation on how these terms are used to group countries together for analytical purposes,
processes of “creative destruction” (Schumpeter, 1934; 1939; 1943) wrought by the introduction and diffusion of Internet-related telecommunications technologies. As articulated in the 1930’s and 1940’s by Schumpeter himself, or as revived and re-articulated by neo-Schumpeterians in the 1980’s and 1990’s (e.g., Nelson and Winter, 1982; Heertje and Perlman, 1990; Cohen, 1995; Harris, 1998), the “carrying out of new combinations” of factors and products results in the creative destruction of old products and firms through forces of competition. The creative destruction process applied to telecoms implies innovation and competition with potentially negative and positive implications for the privatizing enterprise. Internet-based telephony technology allows a new class of domestic and foreign computer equipment and software, as well as start-up telecoms, to invade incumbents’ traditional voice communications market segments and destroy incumbent enterprise value. At the same time, however, growth of Internet-based data traffic along the existing backbone of incumbent enterprises provides new avenues for revenue growth for former state-owned telecoms and enhanced enterprise value. The broad swings in enterprise valuation these negative and positive factors engender require valuation models capturing a range of reasonable enterprise valuations rather than reliance on any point estimate of enterprise value.

This article provides such a complementary model of fundamental enterprise valuation tailored to the contingencies frequently encountered by emerging-market telecommunications firms facing these processes of creative destruction. To make this point in detail, the remainder of this article is laid out in four additional sections below. Section 2 provides additional review of relevant academic and professional literatures on privatization and valuation issues generally and with specific application to telecoms in emerging-market settings. Section 3 lays out our fundamental valuation model, first with an explanation of different classes of factors often considered in emerging-market enterprise valuation, including those factors related to Internet-led change. Second we explain how such factors are operationalized in commonly used discounted cash-flow and comparable valuation models. Third we show how such models may be assessed contingently with so-called Monte Carlo simulation methods. As we will illustrate in this section of the article, probabilistic valuation methodologies such as the Monte Carlo

see, e.g., International Financial Corporation (1999).
Carlo simulation method are well-suited for dealing with the different types of contingencies substantially affecting enterprise valuation, including the impact of Internet-related factors on emerging-market telecoms valuation. Section 4 of the article applies our model to a recent case of attempted enterprise valuation and privatization for Turkey’s state-owned telecoms, Turk Telekom. Using data from Turk Telekom’s aborted privatization in 1997-1998, we illustrate the individual and interactive impact of fundamental country-, industry- and enterprise-specific contingencies influencing the overall value of the entity’s assets. We show how negative and positive contingencies associated with Internet-related factors can induce swings in enterprise value worth billions of dollars to Turkish state and private investors. Section 5 concludes the article with a discussion of the academic and professional research implications of using our contingent model of fundamental enterprise valuation in conjunction with other valuation models. We highlight in this conclusion the impact of factors linked to sale modalities as well as with enterprise fundamentals for emerging-market telecoms venturing forth in the “Internet-based” industry.

**THE PRIVATIZATION PHENOMENON IN HISTORY AND RESEARCH**

*The Concept and Practice of Enterprise Privatization*

Both as policy and research subject matters, privatization is a recent phenomenon. Some scholars consider West German Chancellor Konrad Adenauer’s “denationalization” program in early 1960s as the first large-scale attempt to move state-owned or controlled assets to the private sector (Megginson and Netter, 1999). More commentators, however, look to British Prime Minister Margaret Thatcher and her privatization program of the 1980s as the first whole-sale shift in assets as well as in managerial mindset from state- to market-oriented control principles. Indeed, she and other leading ideologists in the British Conservative Party, such as Enoch Powell, are credited with first coining and then popularizing the term “privatization” rather than denationalization to describe their policies (Yergin and Stanislaw, 1998).

The application of privatization policies during the last two decades has been worldwide. Several researchers have chronicled the progress of these policies on a country-by-country basis including Guislain (1997) and Megginson (1998). In the developed world, French governments in the mid-1980s and again in the mid 1990s privatized more than 30 companies including such state-controlled icons as
Renault. The Japanese experience with privatization since the 1980s saw the largest enterprise sell-off in the world to date when Nippon Telephone and Telegraph ("NTT") was sold to shareholders in 1987 and 1988. The subsequent spin-off of NTT’s cellular division, NTT Do-Co-Mo, in late 1998 instantly created the third largest company in terms of market capitalization on the Nikkei; NTT without Do-Co-Mo remained the largest (Vaaler, 2001). The US experience with privatization in the 1980s also saw a substantial transfer of assets to private hands though many of these transfers involved state and local government-owned or controlled rather than federal government-owned or controlled assets (Vernon, 1988). Research on the privatization experience in smaller developed countries such as Belgium (Vincent, 1995), Sweden (Prokopenko, 1995) and New Zealand (Duncan and Bollard, 1992) suggests that the movement from state- to market-oriented principles was no less dramatic.

The privatization phenomenon found its way to emerging-market countries starting in the late 1980s, and has been widespread in the last decade. In Latin America, Chile, Argentina and Mexico embarked on privatization programs earliest and perhaps most ambitiously in terms of the number of enterprises and dollar-value sold (Guislain, 1997; LaPorta and Lopez-de-Silanes, 1997). In Central and Eastern Europe, privatization efforts in the Czech Republic, Hungary and Poland (Borish, M. and M. Noël, 1996) and Russia (Boycko et al., 1995) have received substantial attention while policies undertaken in Bulgaria (Due and Schmidt, 1995), Romania (Lhomel, 1993) and countries of the former Soviet Union (Rozenfelds, 1993; Joskow et al., 1994; OECD, 1995) have, perhaps, received less coverage. Megginson (1999) holds that the privatization phenomenon in Sub-Saharan Africa is particularly under-reported, even though research by Kerf and Smith (1996) and others note substantial progress and future potential.

Stanbury (1994) suggests that emerging-market countries should have led rather than followed the lead of industrialized countries in implementing privatization programs in the 1980s and 1990s. Fiscal concerns were more acute in emerging-market countries compared to industrialized countries and the burdening of maintaining state-owned or controlled enterprises more onerous. Ramamurti (1992) echoes this point by showing that countries running higher budget deficits, accruing more foreign debt,
and experiencing greater productive inefficiency in the administration of state-owned enterprises—a
description of many emerging-market countries in the 1980s and 1990s-- are more likely to implement
privatization policies. Vernon-Wortzel and Wortzel (1989) argue that despite their predisposition to
embrace privatization policies, emerging-market countries may be stifled in the implementation of such
policies because of the absence of key factors including professional management expertise, capital, or a
stable legal and regulatory framework. Research by Galal et al. (1994) highlight the small absolute size
of national economies and slower economic growth rates of many developing countries as potentially-
limiting factors in the successful implementation of state privatization programs. At a minimum, such
country-level, industry- (regulatory-) and enterprise-specific contingencies explain varying degrees of
success in privatization programs across emerging-market countries in Latin America, Central and
Eastern Europe and elsewhere.

Privatization-Related Performance and Pricing

Almost as soon as policies were implemented, researchers sought to understand whether and why
privatized enterprises performed differently. After early research by Caves and Christenson (1981) in
Canada, and Yarrow (1986) and Vickers and Yarrow (1988) in the UK suggested that privatized
enterprises were no more productively efficient than their nationalized counterparts, a steady flow of
empirical research led by Megginson and his collaborators (Meggginson et al., 1994; Megginson, , 1998;
D’Souza and Megginson, 1999; Megginson and Netter, 1999) established that, for a range of countries
and industries, enterprise privatization was associated with superior operating returns, employee
productivity and turnover in either top-management teams, directorial boards or both.

Many of these observed changes in enterprise behavior and performance are justified in terms of
the re-alignment of enterprise stakeholder incentives, particularly the incentives of enterprise owners
(principals) and enterprise managers (agents) (Jensen and Meckling, 1976; Holmström, 1979). As Hart,
Shleifer and Vishny (1997) and others point out, private ownership provides strong incentives for
managers to innovate new products and markets, but also contain costs. Where managers and or directors
fail in this regard, wealth-maximizing shareholders can replace them. Where shareholders fail to guide
these agents toward a wealth maximizing business strategy, the market for corporate control will lead to a transfer of shares to more vigilant holders willing to pay more. Post-privatization turnover in management and directors, and enhanced employee productivity and firm performance are consistent with this principal-agent perspective on enterprise privatization.

Alongside this performance research stream, another stream has focused on enterprise valuation and sale modalities. The two streams are complementary. The valuation and sale literature provides insight on the current resources and prospective performance of the enterprise as perceived by bidders for the enterprise. With its focus on post-hoc accounting measures of profitability such as operating income, return on sales and return on assets, the performance literature shapes our understanding of the enterprise’s competitive strategy and performance after transfer to shareholders.

As noted above, much of the valuation literature focuses on the impact of different sale modalities on enterprise pricing. We have already noted research sales modalities and enterprise valuation by Perotti (1995), Boycko et al. (1996), Hillion and Young (1996), Hingorani et al. (1997) and Aggarwal and Harper (2001). In addition, Bolton (1992) suggests that speedy sales processes tend to increase the pricing premia the state may obtain from prospective purchasers. The justification here is that immediately after the announcement of asset sales by the state, there is increased interest by prospective buyers. Bolton (1992) also holds that turnover in enterprise management during the privatization process is not linked to superior enterprise performance. Barberis et al. (1996) find that turnover in enterprise management prior to privatization has a positive impact on enterprise valuation. Megginson’s (1994) examination of management turnover and operating performance is consistent with the findings of Barberis et al. (1995) when examining enterprises prior to privatization. Aggarwal and Harper (1998; 2001) suggest that sales restricting foreign investor participation reduce competition during the sales process and depress enterprise asset values.

There is also a well-developed literature on initial public offerings and newly-privatized firms. Jones et al. (1998) find that governments (and the investment banks representing them) consistently underprice share issuance privatizations, favor domestic investors in share allocations, and impose
significant control restrictions on the new shareholders in the privatized firm. These findings are consistent with Perotti (1995) who showed that governments significantly underprice shares in order to signal investors regarding their disposition to influence enterprise strategy and performance in the short- and medium-term. Initial public offering share prices examined by Bias and Perotti (1997) lead to similar conclusions regarding government signalling about its future role as industry regulator and financial guarantor for the privatized enterprise in the short- to medium-term.

Aside from this well-developed literature dealing with sale modalities, a related though less developed line of research has sought to isolate the impact of fundamental macroeconomic, industrial and enterprise-specific factors affecting enterprise asset values realized at sale. Vuylsteke (1988), Kikeri et al. (1994) and Shleifer and Vishny (1994), for example, argue that macroeconomic stability improves enterprise valuation in part because public budgetary constraints are less likely and the possibility of occasional state support for the newly-privatized enterprise is more likely. Lopez-de-Silanes (1996) comes closest, perhaps, to the thrust of this research when, in the process of examining the impact of auction sales processes on asset values, he also notes the impact of fundamental macroeconomic, industry and enterprise-specific factors.

But Lopez-de-Silanes and others undertaking enterprise valuation research have done little to come to grips with the valuation impact of various Internet-related factors at these national macroeconomic, industry and enterprise levels. As was noted above, if one views our prior research on fundamental economic, technical, and policy characteristics of the Internet economy, in aggregate, one can begin to discern the reasons for the wide variation in Internet enterprise valuations, and the equally wide range of expected effects of the Internet on established enterprises – even when those enterprises are thought to be in the same industry. Taken together, our prior research explains why we should expect continued wide (and wild) swings in Internet-impacted enterprise valuations.

First, it was shown how the Internet has novel economic qualities derived from its technical features and policy framework which differentiate firms and services relying on the Internet from firms
still based upon earlier generations of technology. (McKnight and Bailey, 1997) New markets in bandwidth and services can thereby be created, challenging traditional telecommunications firm structures, strategies, pricing models – and enterprise valuations. (McKnight and Lehr, 1998; Lehr and McKnight, 2000; McKnight and Boroumand, 2000) The consequences for public policymakers stemming from the Internet’s broad societal impact include the need to rethink traditional telecommunications and television regulation, as well as the challenge of how to treat new Internet services, which do not fit in the old regulatory models. (Neuman, McKnight, and Solomon, 1997; McKnight, Lehr, and Clark, 2001) Finally, the nature of Internet business models has been explored, and the reasons for their inherent dynamism and instability explained. (McKnight, 2001) What is addressed for the first time by us in this article, is how to put the pieces together to develop an appropriate metric for valuing a firm in the Internet economy. The goal of the model presented below is to incorporate the probabilistic effects on valuation wrought by these different types of factors shaping the Internet economy.

FUNDAMENTAL VALUATION MODEL DEVELOPMENT

Finding the fundamental value of the privatizing enterprise under these conditions is not only a critical function in the broader privatization process, it is also complex and challenging. We outline in this section of the book article the central theoretical tenets of cross-border valuation in emerging-market country environments and illustrate their application to privatizing enterprise valuation based on discounted cash flows (“DCF”) examined under different discrete alternative scenarios and under Monte Carlo simulation.

Basic Tenets of Cross-Border Valuation

As noted by Lopez-de-Silanes (1996), enterprise privatization takes place within the context of various factors related to the macroeconomic, industrial and organizational environment in which the privatized enterprise is likely to operate after sale. As Jones et al., (1998) suggest, foreign investors play a significant role in creating and maintaining competitive bidding for enterprise assets. These different types of factors and players in the bidding process provide the backdrop for our inquiry into how foreign
investors approach the valuation of a privatizing enterprise. When valuing assets across borders, the basic approach may at first seem quite similar to approaches used for valuing domestically-based enterprises.

As Brigham (1995) and Brealy and Meyers (1996) note, however, foreign investors must consider the following additional factors specific to cross-border valuations:

- The choice of currency, foreign (local) or domestic (home), in which to execute the analysis;
- whether or not to discount foreign cash flows at the time they are earned or only as they are remitted home to the parent;
- whether or not to use foreign or domestic tax rates;
- the proper calculation of the cost of capital used to discount the cash flows; and
- the appropriate treatment of special risks unique to cross border investments such as foreign exchange risk, political risk, and so forth.

Firstly, the estimation of cash flows is generally much more complex for non-domestic investments. Secondly, these cash flows have to be converted into the “operating currency” of the investor, and are thus subject to future exchange rate changes. Thirdly, any dividends that may be paid may be subject to both foreign- and home-country government taxation. In addition, a foreign government may restrict the amount of cash flow that may be repatriated to the foreign investor. Some commentators hold that, from the perspective of a foreign investor, the cash flows relevant for the analysis of a foreign investment should be treated similarly to the cash flows from a foreign “subsidiary” unit to its parent company in the home-country.2

When valuing a cross-border investment, we have to keep in mind the principle of consistency. Foreign currency cash flows have to be discounted with a foreign currency discount rate, and US-dollar cash flows have to be discounted with a US-dollar discount rate. The following table outlines the two different methods of valuing a foreign corporation, one based on domestic-currency cash flows, and a second one based on foreign-denominated cash flows.

(Insert Table 1 Approximately Here)

In countries with high inflation, inefficient or volatile capital markets, Method 1 may be superior to Method 2, because it is often impossible to determine a foreign-currency-denominated weighted average cost of capital (“WACC”). Some emerging-market countries may lack readily identifiable markets for
determining “riskless” domestic securities, or may not have a sufficiently long history of equity market returns to permit accurate measurement of local equity-market risk premia. In emerging-market countries with a low likelihood of dividend-repatriation restriction, more commonly practiced valuation techniques such as the discounting of expected free cash flows by a WACC might yield accurate results. This recommendation is based upon the same principle used in domestic settings. Indeed, even if the enterprise does not pay out all of its earnings, the cash generated by it is the amount available for distribution to shareholders, and over which the shareholders have an ownership claim. In other words, retained earnings add to the value of the equity-holders’ (shareholders’) claims.

The resulting discounted cash flow analysis is based on the commonly accepted premise that the value of an enterprise equals the stream of its future cash flows, discounted at an appropriate rate reflecting the time value of money. An algebraic formulation of this premise is given below in (1):

\[
\text{Enterprise Value} = \sum_{i=1}^{n} \frac{\text{Cash flow}_i}{(1 + r)^i}
\]

In (1), \(n\) is the “life of the enterprise”, \(i\) is the number periods (e.g., years, quarters, months) in the life of the enterprise, and \(r\) is the appropriate discount rate. In many cases it is difficult to predict cash flows beyond 5–10 years. Therefore, many valuations are broken down into an explicit forecast period for the near future, and then the value of cash flows beyond that explicit forecast period, often referred to as the “terminal value”. Common approaches to derive a terminal value include the so-called “perpetuity method”. This method assumes that the cash flow of the last year of the explicit forecast period will grow through an infinite number of years. Another common approach is the so-called “market-value method”. This method assumes that the company will be sold after the explicit forecast period on the basis of earnings multiples. Therefore, the valuation of an enterprise may be formulated as in (2) below for a 5-year explicit forecast period:

\[
\text{Enterprise Value} = \sum_{i=1}^{n} \frac{\text{Cash flow}_i}{(1 + r)^i} + \frac{\text{Terminal Value}}{(1 + r)^n}
\]

---

An analyst might use the so-called “capital cash flow method”. This method is explained briefly in the next paragraph. It involves subtracting the value of “today’s” net debt --defined as interest-bearing debt, such as long-term debt, minus excess cash at time \( i=0 \)-- from the enterprise value. This yields the \textit{equity value} of the enterprise in (3) below:

\[
\text{(3) Equity Value} = \left( \sum_{i=1}^{5} \frac{\text{Cash flow}_i}{(1 + r)^i} + \frac{\text{Terminal Value}}{(1 + r)^6} \right) - \text{Value of Net Debt}
\]

Capital cash flow is the cash made available by the enterprise’s businesses and available (in principle) for distribution to the suppliers of capital as a return on their investments. The suppliers of capital comprise both equity and debt providers. A common way to compute capital cash flow is as follows:

\[
\text{Net Income} + \text{Depreciation} - \text{Capital Expenditure} - \text{Change in Working Capital} + \text{Pretax Interest} = \text{Capital Cash Flow}
\]

These cash flows have to be discounted at the pre-tax cost of capital, which is also called “asset return”. Note that capital cash flows differ slightly from another commonly-used cash flow method, called the discounted “free cash flow method”. The difference between these two methods is the treatment of the tax shield on interest payments made by the enterprise. Whereas capital cash flows take the tax shields into the cash flows --the numerator in Equations (1)-(3) above, free cash flows take the tax shields into the discount rate --the denominator in Equations (1)-(3) above. Indeed, the appropriate discount rate for free cash flows is the \textit{after-tax} cost of debt. The pre-tax cost of capital for discounting capital cash flows is the cost of the equity portion and pre-tax cost of the debt portion. This is defined as:

\[
\text{(4) Pretax WACC} = [w_e \times k_e] + [w_d \times k_d]
\]
where $w = weight$, $k = pre-tax cost$, subscript $e = equity$, subscript $d = debt$. Similar to domestic WACC computations, the weight of debt or equity refers to the long-term target capital structure of the enterprise. Furthermore, the use of WACC as a discount rate also implicitly assumes that the ratio of market values of debt and equity claims on the enterprise’s total value remains more or less constant. If it is known in advance that the capital structure will change, it might be necessary to recompute the WACC for each period.

The pretax cost of debt is equivalent to the cost of borrowing in the currency in question. In practice, the cost of bonds or loans with 10-year maturities is often taken as a proxy for the cost of borrowing. The levered cost of equity for the company can be calculated by the capital asset pricing model ("CAPM"). CAPM defines the cost of equity as follows:

$$K_e = R_f + \beta \times (R_m - R_f)$$

where $K_e$ is the levered cost of equity, $R_f$ is the risk-free rate of return, generally the return on long-term government bonds, $\beta$ is the enterprise beta, $(R_m - R_f)$ is the difference between the expected return on the market, $R_m$, and the risk free rate of return, $R_f$, also referred to as the market premium.

### Adjusting for Risks Associated with Privatization in Emerging Markets

Discounted cash flow valuation approaches demonstrated above provide popular methodologies for valuing a given asset or enterprise. Again, however, there are additional considerations to take into account when valuing a privatizing enterprise domiciled in an emerging-market country. In these contexts, there is often a lack of data of the sort commonly used to value assets and enterprises domiciled in developed countries with sophisticated capital markets. For example, in emerging markets, there is often no historical data, or no credible historical data facilitating the projection of future cash flows for a particular enterprise. This makes the valuation job more difficult but not impossible. Projections of cash flows, measures of risk and other data might be obtained by looking at other enterprises in the same or

---

3 A beta is the long-term co-variance of a stock to its underlying market. The average beta is 1.0, and if the stock is more volatile than the stock market, the beta is $> 1.0$, if the market is more volatile than the stock, the beta is $< 1.0$. 

16
similar countries and lines of business. We briefly describe common approaches to solving three typical
modeling puzzles in emerging-market privatization valuation directly below.

Identifying the Proper Asset Beta

Central to determining the discounted cash flow value of a privatizing enterprise is determining
the proper WACC. And a key component of the WACC is the asset beta. To examine our solution to
identification of the proper asset beta to apply, consider a state-owned telecommunications enterprise up
for sale to foreign investors. The asset beta of a telecoms in an emerging-market country might be
obtained by sampling asset betas of other publicly-traded telecoms. There is however an important
problem with taking asset betas from other countries. For instance, if we sample from US telecoms, we
may find out that the average asset beta is around 0.7. These firms operate under a different, and in most
cases more predictable, regulatory framework. Since the business risk (and thus the asset beta) is a
function of the regulatory framework, it is probably necessary to adjust the beta for the prevailing
uncertainties in the regulatory structure of the emerging-market telecoms under analysis. The adjustment
of the asset beta again is a function of the subjective assessment of the stability of the future regulatory
structure of the emerging market country. It may, therefore, be useful to sample telecoms in other, more
comparable emerging market countries, since their situation will shed more light on how to adjust risks
for the emerging-market telecoms of central interest.

With Internet-related factors, for example, sampling for comparability purposes might focus on
telecoms operating in emerging economies with similar rates of Internet-penetration measured in terms of
the number of Internet service providers, with similar rates of personal computer use, and or similar rates
of digital teledensity (Figuera, 1999). These measures of Internet receptivity provide a good proxy for the
speed with which new entrants might be able to diffuse alternative services and products—with or

4 Note that the asset beta corresponds to the unlevered equity beta. Whereas the levered equity beta is composed of
both the business risk and the financial risk of the company, the asset beta is an indication for the business risk only.
It is calculated by multiplying a levered equity beta of a comparable firm with its Equity / Capitalization ratio. $\beta_a = \beta_e \times \left[ \frac{\text{Equity}}{\text{Capitalization}} \right]$. Capitalization here is the sum of the market value of equity and long term debt.
sometimes without the sanction of incumbents and regulators. They also provide insight on the potential for growth in new Internet-related market segments the incumbent privatizing enterprise might serve.

**Adjusting for Political Risks**

Adjustment of the business risk through adjusting the asset beta relates to the regulatory uncertainties. Emerging-market countries may also exhibit a relatively high degree of political risk that needs to be accounted for in valuing privatizing enterprises. Some observers define political risk as a threat that a foreign government will change the rules of the game — that is, break a promise or understanding — after the investment is made and the costs irretrievably sunk (Brealy and Meyers, 1996). This risk is akin to opportunistic “hold-up” problems analyzed from transaction cost economics perspectives (Williamson, 1975; 1985). Outright expropriation may be less of a concern for managers today than in the past (Minor, 1994), but political risks still present themselves in more subtle forms, such as restrictions on the payment of dividends or as constraints on the top management’s ability to operate the enterprise freely and for the primary benefit of its shareholders. In the case of Internet-related political risks, such subtleties might include state subsidies for incumbent build-outs of fixed-line and or discriminatory tax treatment of start-up mobile-based voice and data transmission infrastructure investment.

There are at least two ways to account for political risk when valuing an enterprise. First, the cash flows might be adjusted downward to account for an “insurance premium” which would be paid to political risk-insuring entities, such as the US Overseas Private Investment Corporation (“OPIC”), the World Bank’s Multilateral Investment Guaranty Agency (“MIGA”), and private insurance firms like US-based AIG or Europe-based Allianz. This insurance premium would effectively figure as an expense in the income statement, reduce cash flows, and therefore reduce the enterprise’s value. The reduction in value corresponds to the deeper value “discount” investors would require to take on additional political risk.

A second way to factor political risk into the enterprise valuation is to adjust the discount rate upward to reflect a “premium”. By adding this premium, the discount rate increases, which in turn,
decreases the enterprise’s valuation. This new calculation corresponds to the political risk-adjusted valuation of the enterprise.

By how much should this market premium be raised? Lessard (1996) notes that practitioners often take country-ratings of major credit-rating agencies as a reasonable proxy for political risk. To illustrate how practitioners use these proxies, consider the case of an investor trying calculate a discount rate for US-dollar denominated investment in an emerging-market country enterprise. She would not use a discount rate based on US government bonds with a 10-year maturity. This approach would not take into account the additional political risk this foreign investment carriers compared to a similar investment domiciled in the US itself. The investor must ascertain the market premium. Assume that the enterprise is domiciled in a country with a “B” overall country-risk rating from a major credit-rating agency like US-based Moody’s Investor Services, US-based Standard & Poor’s, or UK-based International Bank Credit Analysis (“IBCA”). Assume also that this same country issues 10-year-term US-dollar denominated debt with an average yield of 9.5% but that comparable US Treasury bonds with 10-year maturities yield only 7%. The market premium for US-dollar-denominated debt in the emerging-market country is 7.5%. The risk-adjusted market premium is, therefore, \(7.5\% + [9.5\% - 7\%] = 10.0\%\).

**Adjusting for “Golden Share” Provisions**

Some privatizations are so structured that the state retains a “golden share”, which confers to the government special rights that go well beyond those attached to ordinary shares. In some cases, they lapse at a pre-determined date. The rights conferred by golden shares frequently relate to the limitation of foreign ownership. For example, the state may be able to veto the sale of a controlling block of equity to a foreign investor. From a valuation perspective, a golden share diminishes the enterprise’s price by limiting the non-governmental shareholder’s market of prospective equity bidders. Analytically, a golden share corresponds to a “real option” (Trigeorgis, 1996) to defer or abandon certain extraordinary transactions. This option is “bought” and held by the government and “written” by the eventual owners of the privatizing enterprise.
The imposition of a golden share often leads to an increased required return on equity, which, in turn, increases the cost of equity to the privatized enterprise. That is because the golden share entails limited control over the enterprise’s operations in certain situations. For example, the golden share provision may be used by the state to limit certain investors from acquiring the enterprise even if current managers are doing a poor job. The credible threat of a take-over may enhance the returns of the enterprise’s initial equity owners. It gives shareholders a freer hand to change management if they are not serving the owners’ interests. A golden share constrains investors from exercising such control over the enterprise and, therefore, may reduce the enterprise’s value to them. The extent of such decrease is a function of the rights retained by the government. An adjustment to the cost of equity is one possible way to account for the impact of golden shares on enterprise valuation. Another approach is to adjust the company’s value through “real option” valuation methods, but such methods are not within the scope of this article.

Sensitivity and Discrete Alternative Scenario Analyses

As pointed out above, privatizations in emerging-market countries often reveal multiple dimensions of risk and substantial uncertainty in the forecast of future cash flows. One way to account for these deal-specific uncertainties, is to test the valuation under a series of changing assumptions. This sort of “sensitivity” analysis requires the expression of the discounted cash flow model in terms of key variables. It then requires a systematic re-calculation based on the assumption that the variables may have been misestimated earlier. In practice, this means appraisers need to examine the sensitivity of an enterprise’s value to contingencies including the following:

♦ changes in interest rates, which would affect the discount rate used;
♦ changes in the competitive environment, which would affect the forecasted growth in revenue or the operating margin;
♦ changes in the regulatory environment, which would affect the “business risk”, expressed by the unlevered, or “asset” beta; and
♦ other key variables which would influence the market price of the enterprise.

Note that US T-bills are rated “AAA” and are considered risk-free.
Valuation reports often contain scenario analyses. Given a base case representing the analyst’s “best guess” about the nature of key variables in the near future, a few reasonable alternative scenarios are then formulated where the key variables are changed. Often there will be two alternative scenarios. A “worst case” scenario might, for example, project both an increase in interest rates, thus raising the discount rate, and market-entry by a large competitor, thus lowering operating margins. A “best case” scenario might project both the maintenance of a regulated-entry monopoly, thus raising operating margins, and a macro-economic upswing, thus raising revenue growth. One difficulty with this kind of analysis is how to assess with precision what a “worst”, “best”, or “most likely” case really implies. It is often far from easy to extract from a forecaster’s subjective perspective the complete probability distribution of possible outcomes. A second problem with sensitivity analysis is that the underlying variables are likely to be correlated with one another. For example, a change in the rate of price-inflation experienced by an enterprise over some period of time may increase both the price of its products sold and its cost of goods sold. The net impact of these related contingencies is sometimes difficult to separate out and evaluate individually. Analysts often try to avoid this pitfall by defining variables that are substantially independent of one another.

Monte Carlo Simulation

Sensitivity analyses allow assessment of change in enterprise-value related to a change in one key variable. Scenario analyses may go further than just a few discrete alternatives. While enterprise-value is often examined in the context of a limited number of plausible combinations of key variables, Monte Carlo simulation is a tool for considering all possible combinations of key variables; therefore, it can yield an entire distribution of valuations to consider. Monte Carlo simulation, or simply a “Monte Carlo”, usually involves a computer program selecting random values for each of the key variables of interest to the analyst. These random choices should conform to foreseeable real-life values. Each set of random values becomes the basis for a single “what-if-scenario” to be plugged into the valuation model for calculation. After a finite number of trials, Monte Carlo returns a distribution of “what-if-scenarios” and, therefore, provides the analyst with a probabilistic perspective on the value of the enterprise.
There are essentially three steps to take in running a Monte Carlo simulation:

**Step 1: Model the Enterprise Valuation**

In most cases, a discounted cash flow valuation model can be used in a Monte Carlo Simulation. If using a computer spreadsheet program to create this model, remember to keep the key variables for the model in a separate cell of the spreadsheet. For example, keep the expected discount rate, revenue growth rates, total market size, and productivity gains used in the valuation model in a separate cell labeled, say, “Assumptions”.

**Step 2: Specify Probabilities for Forecast Errors**

Next, specify the possible errors in these assumed values. For example, the expected total market size may be 10 million units, but other experts in the industry put the total market size at anywhere between 8.5 million and 11.5 million. The analysts expected value of 10 million seems reasonable, the information from the other experts suggests forecast error in the range of plus or minus 15 percent. In a normal distribution of possible market-size outcomes, .015 is approximately three standard deviations away from the mean. That means there is a 99% chance that all possible future market sizes will fall between 8.5 and 11.5 million. The most likely size of the market is the expected value of 10 million. In moving to the left or to the right of this point, the probability of finding a different market size decreases. The decrease follows a “bell-shaped” curve. Of course, you can assume other distributions of probabilities. If, for example, 10 million is considered as likely an outcome as 8.5 million and as 11.5 million, the distribution of errors might be characterized as a “uniform” rectangular shape, rather than as a normal bell-shape.

**Step 3: Simulate the Cash Flows**

Next, let the computer calculate the cash flows for each period, based on the variable assumptions and the probability distribution assigned to each variable. The computer will record each outcome, and after many iterations, will give estimates of the enterprise’s value and information on the probability distribution surrounding the estimates. Results from using a valuation model and a Monte Carlo simulation are only as good as their variable assumptions. Nevertheless, a simulation has the obvious
merit of compelling the forecaster and the decision-maker to face up to uncertainty and to interdependencies. The construction of a Monte Carlo simulation will almost certainly contribute to a better understanding of what drives enterprise value and what can go wrong. Finally, it improves the forecast cash flows and thus increases the level of confidence in the calculations of the net present value.

APPLYING THE VALUATION MODEL: THE CASE OF TURK TELEKOM

Background on Turk Telekom’s Equity Offering

The Turkish government’s proposed sale of its telecommunications enterprise, Turk Telekom (“TT”) gives us the opportunity to apply the model developed above to an actual case of an emerging-market privatization. TT’s proposed privatization exhibits many of the features commonly encountered in emerging-market privatizations. First, it is an emerging-market country category with a per capita GDP of approximately US$5,000, GDP growth rates in the 1990’s averaging 7% and a small, but fast-developing domestic stock market. Turkey also exhibits substantial price inflation; in certain years in the 1990s, inflation exceeded 80%. The country’s governmental stability has also been put into question with a history of military involvement in and outright overthrow of civilian governments. In the 1990s, civilian governments have been derailed from carrying out many privatization policies due to shifting governing coalitions and undue influence from anti-privatization minorities. Indeed, one of the aims of the privatization program is to lower the government’s influence on specific enterprises and refocus its attention on broader political and economic development policies, including but not limited to entry into the European Union. The proposed privatization of TT was announced in 1996 but in early 1998, after preliminary discussions with several potential foreign investors, the Turkish government backed away from the project. Commentators in Turkey attributed this to several factors including recent financial crises in other emerging-market countries, lingering concerns about Turkey’s telecommunications regulatory regime, and heightened political instability in Turkey. In what many commentators described as a “slow-motion” coup, Turkish military leaders put pressure on a government led by an Islamic fundamentalist party to resign. Subsequent coalition governments have been reluctant to take the
politically-risky step of beginning the sell-off of TT. Parliamentary elections scheduled in 1999 dealt with this issue by providing Turkey with a secular Center-Right government enjoying a substantial majority. TT is once again scheduled for partial sale to private investors in sometime in the second half of 2000.

Despite its failure, TT’s attempted privatization in 1997 and 1998 lays out an interesting array of contingencies to assess in any “fundamental” valuation model. Obviously, many of the contingencies are related to country-level macro-economic and political factors. But they also include an interesting mix of contingencies related to the Turkish telecommunications industry structure. As a state-owned telecommunications enterprise, TT was the monopoly provider of practically all communications services in the country. Indeed, the first real competition to TT was only introduced in mid-1999 and was limited to mobile telephone services. On the other hand, Turkey’s (“TUR”) relatively high level of Internet hosts to telephone lines as of the mid-1990’s suggests the existence of a large number of potential entrants able to exploit Internet-based telephony technologies.

(Place Figure 1 Approximately Here)

The Ministry of Telecommunications still sets prices annually for TT and mandates subsidies to lower the cost of local calls, which in turn, increases long-distance and international tolls. This pricing structure is not based on any model in used in developed countries –think for example of “cost-plus” or “CPI-plus” pricing approaches used in some market segments of the US and UK. Turkey’s fast-growing telecommunications industry in the 1990s might be attributed to its formerly-low teledensity. With only 11 phone lines per 100 inhabitants in 1985, the Turkish government investments through TT led to approximately 23 phone lines per 100 inhabitants in 1995. This is still below other countries with comparable per capita GDPs. On the other hand, teledensity in the Istanbul area is relatively high and made up largely of digital lines and switches adaptable to many emerging telecommunications technologies. Add to this the absence of any coherent regulatory framework or independent regulatory body, it becomes evident that the industry structure in which a privatized TT would operate is fraught with uncertainty.
Enterprise-specific factors in TT also make for interesting analysis. In 1995, TT was transformed from a state-agency tied to the Ministry of Post, Telegraphs and Telecommunications to a separate state-owned enterprise governed by private corporate law. Prior to this “corporatization”, TT was not mandated to maximize productive efficiencies. Performance indicators such as high numbers of employees per phone line, negative net profit margins, chronic under-investment, uncompetitive sourcing practices, and government-appointed supervisors illustrate TT’s organizational challenge at the time of its sale to investors.

(Place Table 2 Approximately Here)

These different contingencies, summarized in Table 2 above, must be evaluated by foreign investors. Indeed, the participation of foreign investors in TT’s equity offering is critical in at least three respects. First, demand from foreign institutions is important for building a market for TT’s shares and for establishing the legitimacy of the enterprise in the private sector. Second, financial investment by certain foreign institutions –so-called “strategic investors” like US and European telecommunications firms—may prepare the way for subsequent transfers of technology and management skills to TT. Third, a successful placement of TT shares with foreign investors, whether or not they be strategic, paves the way for subsequent sales of state-owned enterprises in Turkey.

We show how four types of political-economic, industrial organizational contingencies may be modeled for their effects on the discounted cash flows and consequent enterprise valuation of TT. We demonstrate two approaches for assessing their impact. Consistent with alternative scenario analyses, the first approach involves holding one type of factor constant and then experimenting with a limited number of discrete combinations of the other three factors. The second approach involves the use of Monte Carlo simulation. This approach allows assessing a broader range of discrete combinations. The prospective outcomes from these two approaches and their implications for different types of foreign investors are then briefly discussed.

*Discounted Cash Flow Valuation*
We apply the capital cash flow method in order to value TT’s equity. The advantage of this valuation approach is its treatment of the unknown cost of debt. TT’s situation in the late 1990s indicates that borrowings are partly subsidized by the government. By taking interest tax shields into the cash flows and not into the discount rate, the effective after-tax cost of debt becomes irrelevant. Capital cash flows equal available cash flow plus pre-tax interest. They are discounted by the pre-tax WACC, which is, in turn determined by TT’s assets not by TT’s capital structure. Therefore, the pre-tax WACC is related closely to TT’s asset risk, reflected in its asset beta, to the risk premium and to the risk-free rate.

Telecommunications firms may enjoy an average asset risk since cash flows are generally stable and operating leverage generally high. A reasonable assumption for an average asset beta is 0.7. Since the asset beta also reflects underlying regulatory risks, the asset return in the “base case” we compute is 0.8. Assuming a risk-free rate of 9.0% and a risk premium of 7.5%, the pre-tax WACC comes to 15.00%. Discounting the capital cash flows by the asset return results in a total enterprise value of some $9.055 billion.

(Insert Table 3 Approximately Here)

Adjusting for Privatization-Related Risks

This “base case” valuation of $9.055 billion does not reflect any of the risks embedded in investing in TT. We take four types of risks as central enterprise value drivers and adjust the enterprise valuation according to appropriate assumptions laid out below. The four risks to be analyzed include: 1) degree of managerial freedom at TT; 2) the competitive situation TT faces; 3) TT’s tariff (pricing) structure; and 4) the institutional stability of Turkey. Each result in adjustments to the privatization valuation model in Table 3 since the choice of forecast on the four factors affects either the level of cash flows or the rate at which they are discounted. By manipulating values for these factors, you will be able to manipulate the extent of such risks according to your perception of TT’s short- and medium-term future. Three of those variables can assume values ranging from 1 to 3, where 1 represents the “best case” scenario and 3 the “worst case scenario. The institutional stability variable is expressed in percent, accounting for the
differential of Turkish sovereign bonds to US treasury bonds. We will discuss each of those categories and plausible assumptions immediately below:

**Degree of Managerial Freedom**

This parameter reflects the independence of TT’s post-privatization management from government interference. The basic assumption here is that the more independent the board is from the government, the more energetically it will be able to implement cost cutting measures. Therefore, this input drives mainly cash outflows. If no government intervention (other than its legal voting power as a value-maximizing majority shareholder) occurs, the entire “block” of TT’s costs is assumed to increase at a smaller rate than TT’s sales. If however the government vetoes several prudential managerial initiatives aimed at cutting costs—it may, for example, veto moves by a privatized TT to cut employment—then we assume that TT’s costs will evolve in line with TT’s sales. We think the “most likely case” is in between these two extreme scenarios, therefore inputting “2” in the assigned cell of Table 3.

**Competitive Situation**

Regulatory uncertainty affects in a first instance the asset risk of TT. Therefore we use this variable in order to influence the asset beta as a function of the post-privatization regulatory environment. Starting with a basic asset risk of 0.8, the model adds 10 basis points for introduction of weak competition and 20 basis points for strong competition. With an increasing asset beta, the discount rate (asset return) goes up, which in turn decreases the value. The “strong competition case” yields an asset return of 18.5%, which compares with 14.75% for the “monopolist” scenario. Since the asset return is the discount rate, it becomes obvious that cash flows discounted by the higher rate are less valuable. We believe the most likely scenario is somewhere in between the monopolist and strong competition futures; a future of some “weak-form” competition will be introduced in the near future. Therefore we assign a “2” to the appropriate cell of Table 3.

**Tariff (Pricing) Structure**

TT’s revenues per main line are low relative to other telecoms in emerging markets. This hints at an unreasonably low pricing structure for TT. With upcoming deregulation, TT may be able to charge
prices that reflect its cost function. However, since the post-privatization tariff structure is under review and will likely be attacked by consumers and politicians, it is difficult to forecast with certainty this chief revenue driver. Therefore we assign this variable to the sales forecast. If tariffs end up being driven substantially by market forces alone, TT should be able charge higher prices, which will be reflected in higher sales growth and operating profits. If however the present distorted pricing structure persists in the near future, then sales and profitability growth may be limited. TT can still increase sales and profits with the given pricing structure. For example, TT may choose to expand its network, particularly in urban areas (Istanbul) where marginal cost per additional line are low and marginal revenue from sophisticated urban consumers may be high. Even so, a distorted pricing structure limits TT’s options. We believe that the yet-to-be-instituted regulator may chose a midway point for reforming the pricing structure. There will be some form of CPI-minus-X pricing which will give TT some (but not complete) discretion to revise pricing on its services. We take this most likely near-term policy to correspond roughly to a “2” as an input in Table 3.

**Institutional Stability**

Here we try to account for a whole range of hidden risks. In the first instance, Turkey is a young democracy with governments often alternating with short frequency. Political decisions regarding the legislative, fiscal and regulatory environment, regarding TT’s public service obligations, regarding tariffs, staffing and so forth may be revised or reversed upon short notice. In this environment, foreign investors will require a higher return from their investments to cover the risks. There are other externalities compelling a higher return for foreigners. It is more costly to undertake due diligence in Turkey. In addition, the foreign investor will have higher costs monitoring the company’s activities and performance. Finally, a lack of liquidity in the Turkish stock market might put foreign investors in a situation where divestment within a short-time span involves a substantial loss in the value of their investment (liquidity risk). We add a risk premium to the discount rate on TT’s cash-flows in order to account for these types of externalities. A 0% spread corresponds to the absence of any substantial political risks and a relatively well integrated and sophisticated market for TT shares worldwide. But we believe that a 3% additional
risk premium – appropriate for many “B+-rated” emerging market countries like Turkey – is a more reasonable assessment to be included in the Table 3’s valuation model.

These four contingencies are summarized in Table 4 immediately below:

(Place Table 4 Approximately Here)

*Accounting for Risks Facing TT*

As Table 5 below indicates, when accounting for these risks, the equity value of TT reduces to approximately US$5.1 billion. Consequently, US$3.9 billion -- the difference between approximately US$9.0 billion non-risk-adjusted valuation and US$5.1 billion risk-adjusted -- represents the price of insuring against the four macroeconomic, industrial and organizational risk contingencies described above.

(Place Table 5 Approximately Here)

By holding three of the parameters constant and by changing just one input, the model can be used in order to quantify the different risk categories *ceteris paribus*.

(Place Table 6 Approximately Here)

Table 6 indicates how each of the given risk categories impact the value of TT. This might help the advising consortium to give its recommendation to the government. Now we can think how easy or difficult the improvement of each of those risks is. Giving complete freedom to the board appears to be a measure which arouses relatively little political discussion and can be implemented in a short time span. This measure would increase TT’s value by $1 billion. On the other end of the spectrum is the improvement of macroeconomic and political risk. Very little can be done in the short- to medium-term to improve Turkey’s relatively weak rating. However, the consortium advising TT as it prepares its equity offering could emphasize for investors a “momentum” toward sovereign ratings and risk profile closer to the developed world in the future. Turkey’s secular government and its ambition to join the European Union may herald greater institutional stability. The task of making these representations about the evolving nature of Turkey’s political and economic development as well as other contingencies will fall
largely to its investment bank, accounting and management advisers. Their credible presentation to
investors is critical to obtaining higher enterprise and equity valuations.

Our approach to ascertaining the “fundamental” value of TT is enhanced through the exploration
of key country-, industry- and organization-based contingencies. But this exploration has been limited to
a few discrete scenarios. This may be overcome by using the Monte-Carlo simulation, which yields a
broader, probabilistic “picture” of the valuation.

(Place Table 7 Approximately Here)

Using chiefly normal distributed assumptions about the different risks, a 1000-trial run of the model
yields a risk-adjusted mean equity value of $5.1 billion, a value very close to the “most likely scenario”
set forth above. The range of values that result from the extreme inputs is from $3.5 billion (minimum) to
$6.7 billion (maximum). Combining the most-likely scenario and the result from the Monte-Carlo
simulation, it seems that a pricing around $5.1 billion seems to reflect the risk-adjusted fair value of TT
in late 1997.

(Place Table 8 Approximately Here)

CONCLUSION

The goal of this article was to develop a framework for assessing the fundamental value of firms
affected by the Internet’s explosive growth, including especially those related to the privatizing of
telecommunications service providers located in emerging-market countries. A substantial stream of
research in economics and public policy has examined in some detail various valuation issues related to
the sale modalities used to transfer enterprises and assets from state to the private hands. But less
attention had been paid to what we showed to be often nettlesome issues related to the intrinsic or
fundamental value of the enterprise. These issues exhibit a contingent character, often asserting
themselves only on occasion rather than continually. We, therefore, chose to develop a contingent
framework incorporating these probabilistic characteristics. When applied to TT, our framework
highlights the substantial swings in emerging-market enterprise value tied to key country-, industry- and
organization-related contingencies. Perhaps as importantly, however, it suggests which of these
contingent factors affecting the swings are within the reasonable control of the enterprise (and its
government) and which of these contingent factors are outside the control of these individuals. Lower-
level organizational contingencies such as enterprise governance, capital investment, and product
manufacturing and pricing are more amenable to change in the short- and medium-term than, say,
regulatory and structural barriers to entry into the Turkish telecommunications industry or the underlying
stability of Turkish political institutions. Arguably, the instability of 1997 and 1998 aborted the
privatization program not only for TT but for several other large state-owned enterprises in Turkey.

But perhaps this conclusion about the exogeneity of country-level factors affecting privatization
requires closer scrutiny. The relationship between institutional stability and privatization may work in
reverse. It is not institutional stability that drives privatization policies and enterprise valuations. On the
contrary, the more enterprises and assets that mover into private hands, the more influential will be
private and particularly private, foreign investor interests will be. Consequently, the state will be less
likely to interfere with the strategies of enterprise investors and managers intended to enhance enterprise
value. This view challenges a commonly held view in the academic and applied policy literature claiming
that certain privatization programs are motivated primarily by “political/ideological” concerns about
limiting the role of government in the national economy, rather by concerns about maximizing enterprise
sales receipts to relieve public financial constraints (e.g., Boycko et al., 1995; Guislain, 1997). Viewed
through this alternative perspective, all broader privatization programs lead to enhanced enterprise
valuations and greater sales receipts if followed through to their completion. As the TT case indicates,
the challenge for many governments in emerging-market countries is to find the resolve to begin such
programs rather than to carry them through to completion.

Aside from this challenge for public policy-makers, there is also embedded in our framework a
substantial challenge laid before enterprise managers. Managers have meaningful opportunities to
influence the corporate governance and competitive positioning of the state-owned enterprise well-before
its equity passes from state- to private-hands. Enterprise corporatization and industry
deregulation/liberalization each provide managers with opportunities to establish a “track record” of
organizational routines and competitive strategies for investors to use as reference. Future research would benefit from closer examination of links between enterprise valuation at privatization and the pre-privatization organizational structures and strategies promoted by enterprise top-managers.

How will the Internet affect the value of firms, whether industry incumbents or Internet-powered new entrants? As we have shown in this article, the Internet will only change everything. For a privatizing telecommunications firm in an emerging market country, for example, someone concerned with the valuation of the firm may wish to consider how the Internet will alter the competitive dynamics of the industry, the rate of growth in customer demand, the price levels as well as the pricing models used, the direction of market evolution, firm resource constraints, and the identity of the firm’s suppliers, regulators, rivals, and customers. To name a few specific factors which will inevitably be different for a telecommunications enterprise operating in an Internet economy. The Monte Carlo simulation has demonstrated how different the outcomes may be, and how risks may compound quickly and with unanticipated consequences. Ready? Place your bets…
REFERENCES


Figure 1: Telephone Lines and Internet Hosts, 1996

(Figuera, 1999)
### Table 1: Methods For Valuing a Foreign-Based Enterprise

<table>
<thead>
<tr>
<th>Step</th>
<th>METHOD 1</th>
<th>METHOD 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Estimate future cash flow in foreign currency</td>
<td>Estimate future cash flows in foreign currency</td>
</tr>
<tr>
<td>2</td>
<td>Convert to dollars (at forecasted exchange rates)</td>
<td>Calculate present value (use foreign currency discount rate)</td>
</tr>
<tr>
<td>3</td>
<td>Calculate present value (use dollar discount rate)</td>
<td>Convert to dollars (use spot rate)</td>
</tr>
</tbody>
</table>

### Table 2: Three Levels of Risk Contingencies For TT

<table>
<thead>
<tr>
<th>LEVEL OF RISK</th>
<th>TYPE OF RISK</th>
<th>MANAGEABILITY OF RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country-Level (Turkey)</td>
<td>♦ Political Stability ♦ Economic Stability</td>
<td>Little probability of improving in short- or medium-term. Privatization may, in fact, improve these factors in long-term.</td>
</tr>
<tr>
<td>Industry-Level (Turkish Telecommunications Sector)</td>
<td>♦ Industry Structure ♦ Regulatory Institutions ♦ Technological Factors</td>
<td>Government plays important role in shaping industry and determining “competitive rules of the game” important to TT in short- and medium-term.</td>
</tr>
<tr>
<td>Organizational-Level (TT)</td>
<td>♦ Product Pricing, Capital Investment Autonomy ♦ Organizational Staffing ♦ Corporate Governance ♦ Corporate Diversification</td>
<td>Government and management can increase TT’s value in the short- and medium-term by implementing appropriate governance structures, engaging in market-driven capital investment programs, and corporate reorganization.</td>
</tr>
</tbody>
</table>
Table 3: Valuation Before Risk-Adjustment

Projections in USD - NOT RISK ADJUSTED

Assumptions:

<table>
<thead>
<tr>
<th>Degree of managerial freedom:</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive situation after privatization:</td>
<td>1</td>
</tr>
<tr>
<td>Tariff structure after privatization:</td>
<td>1</td>
</tr>
<tr>
<td>Stability of democratic institutions:</td>
<td>0%</td>
</tr>
</tbody>
</table>

(1 = no government interference, -> 3 = heavy government interference)
(1= monopolist -> 3 = perfect competitive)
(1= market dictates prices -> 3 = government dictates prices)
(Add risk premium: 0% = mature democracy, 3% for B-rated country)

Calculation of Cost of Capital

<table>
<thead>
<tr>
<th>Riskfree rate</th>
<th>9.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk premium</td>
<td>7.5%</td>
</tr>
<tr>
<td>Asset beta</td>
<td>0.80</td>
</tr>
<tr>
<td>Asset return</td>
<td>15.00%</td>
</tr>
</tbody>
</table>

RESULTS:

<table>
<thead>
<tr>
<th>Enterprise value</th>
<th>$ 9,237</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of debt</td>
<td>$ 183</td>
</tr>
<tr>
<td>Equity value</td>
<td>$ 9,055</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Net sales growth</th>
<th>1996</th>
<th>1,997</th>
<th>1998</th>
<th>3,494</th>
<th>2000</th>
<th>2001</th>
<th>2,000</th>
<th>1,166.75</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9%</td>
<td>2,941</td>
<td>3,206</td>
<td>3,494</td>
<td>3,809</td>
<td>4,151</td>
<td>4,525</td>
<td></td>
</tr>
<tr>
<td>COGS, SG&amp;A, Deprec.</td>
<td>-9%</td>
<td>2,117</td>
<td>2,100</td>
<td>2,083</td>
<td>2,066</td>
<td>2,050</td>
<td>2,033</td>
<td></td>
</tr>
<tr>
<td>EBIT</td>
<td></td>
<td>823</td>
<td>1,105</td>
<td>1,411</td>
<td>1,742</td>
<td>2,102</td>
<td>2,492</td>
<td></td>
</tr>
<tr>
<td>Net interest expense</td>
<td></td>
<td>(67)</td>
<td>(112)</td>
<td>(122)</td>
<td>(133)</td>
<td>(145)</td>
<td>(158)</td>
<td></td>
</tr>
<tr>
<td>EBT</td>
<td></td>
<td>756</td>
<td>993</td>
<td>1,289</td>
<td>1,609</td>
<td>1,956</td>
<td>2,333</td>
<td></td>
</tr>
<tr>
<td>Tax provision</td>
<td></td>
<td>378.07</td>
<td>496.54</td>
<td>644.25</td>
<td>804.42</td>
<td>978.17</td>
<td>1,166.75</td>
<td></td>
</tr>
<tr>
<td>Net income</td>
<td></td>
<td>378</td>
<td>497</td>
<td>644</td>
<td>804</td>
<td>978</td>
<td>1,167</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td></td>
<td>147.04</td>
<td>160.28</td>
<td>174.70</td>
<td>190.43</td>
<td>207.57</td>
<td>226.25</td>
<td></td>
</tr>
<tr>
<td>Change in net working capital</td>
<td></td>
<td>(29.41)</td>
<td>(32.06)</td>
<td>(34.94)</td>
<td>(38.09)</td>
<td>(41.51)</td>
<td>(45.25)</td>
<td></td>
</tr>
<tr>
<td>Capital expenditure</td>
<td></td>
<td>-</td>
<td>(80)</td>
<td>(87)</td>
<td>(89)</td>
<td>(104)</td>
<td>(113)</td>
<td></td>
</tr>
<tr>
<td>Cash flow available</td>
<td></td>
<td>496</td>
<td>545</td>
<td>697</td>
<td>862</td>
<td>1,040</td>
<td>1,235</td>
<td></td>
</tr>
<tr>
<td>Pre-tax interest expense</td>
<td></td>
<td>67</td>
<td>112</td>
<td>122</td>
<td>133</td>
<td>145</td>
<td>158</td>
<td></td>
</tr>
<tr>
<td>Capital cash flow</td>
<td></td>
<td>563</td>
<td>657</td>
<td>819</td>
<td>995</td>
<td>1,186</td>
<td>1,393</td>
<td></td>
</tr>
<tr>
<td>Terminal value</td>
<td></td>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13,930</td>
<td></td>
</tr>
</tbody>
</table>
Table 4: Four Dimensions of Risk

<table>
<thead>
<tr>
<th>RISK CATEGORY</th>
<th>IMPACT ON TT’S OPERATIONS</th>
<th>PARAMETER IN THE FINANCIAL MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial Freedom</td>
<td>Possibility of Cutting Costs</td>
<td>Cash Flows (Cost of Goods Sold)</td>
</tr>
<tr>
<td>Competitive Situation</td>
<td>Competitive Pressures</td>
<td>Cash Flows (Sales)</td>
</tr>
<tr>
<td>Tariff (Pricing) Structure</td>
<td>Pricing Autonomy</td>
<td>Cost of Capital (Asset Beta)</td>
</tr>
<tr>
<td>Institutional Stability</td>
<td>Predictability of Legislative Framework and Policy</td>
<td>Cost of Capital (Risk-Free Rate)</td>
</tr>
</tbody>
</table>
### Table 5: Valuation After Risk Adjustment

**Projections in USD - ADJUSTED FOR RISKS**

**Assumptions:**
- **Degree of managerial freedom:** 2 (1 = no government interference, -> 3 = heavy government interference)
- **Competitive situation after privatization:** 2 (1= monopolist -> 3 = perfect competitive)
- **Tariff structure after privatization:** 2 (1= market dictates prices -> 3 = government dictates prices)
- **Stability of democratic institutions:** 3% (Add risk premium: 0% = mature democracy, 3% for B-rated country)

**Calculation of Cost of Capital**

<table>
<thead>
<tr>
<th></th>
<th>Riskfree rate</th>
<th>Risk premium</th>
<th>Asset beta</th>
<th>Asset return</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RESULTS:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enterprise value</strong></td>
<td>$5,277</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Value of debt</strong></td>
<td>$183</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equity value</strong></td>
<td>$5,095</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Growth**

<table>
<thead>
<tr>
<th></th>
<th>1996</th>
<th>1,997</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>6%</td>
<td>2,941</td>
<td>3,117</td>
<td>3,304</td>
<td>3,503</td>
<td>3,713</td>
</tr>
<tr>
<td>COGS, SG&amp;A, Deprec.</td>
<td>-6%</td>
<td>2,117</td>
<td>2,110</td>
<td>2,102</td>
<td>2,095</td>
<td>2,087</td>
</tr>
<tr>
<td>EBIT</td>
<td></td>
<td>823</td>
<td>1,008</td>
<td>1,202</td>
<td>1,408</td>
<td>1,626</td>
</tr>
<tr>
<td>Net interest expense</td>
<td></td>
<td>(67)</td>
<td>(109)</td>
<td>(116)</td>
<td>(123)</td>
<td>(130)</td>
</tr>
<tr>
<td>EBT</td>
<td></td>
<td>756</td>
<td>898</td>
<td>1,087</td>
<td>1,285</td>
<td>1,496</td>
</tr>
<tr>
<td>Tax provision</td>
<td></td>
<td>378.07</td>
<td>449.21</td>
<td>543.25</td>
<td>642.70</td>
<td>747.87</td>
</tr>
<tr>
<td>Net income</td>
<td></td>
<td>378</td>
<td>449</td>
<td>543</td>
<td>643</td>
<td>748</td>
</tr>
<tr>
<td>Depreciation</td>
<td></td>
<td>147.04</td>
<td>155.87</td>
<td>165.22</td>
<td>175.13</td>
<td>185.64</td>
</tr>
<tr>
<td>Change in net working capital</td>
<td>(29.41)</td>
<td>(31.17)</td>
<td>(33.04)</td>
<td>(35.03)</td>
<td>(37.13)</td>
<td>(39.36)</td>
</tr>
<tr>
<td>Capital expenditure</td>
<td></td>
<td>(78)</td>
<td>(83)</td>
<td>(88)</td>
<td>(93)</td>
<td>(98)</td>
</tr>
<tr>
<td>Cash flow available</td>
<td></td>
<td>496</td>
<td>496</td>
<td>593</td>
<td>695</td>
<td>804</td>
</tr>
<tr>
<td>Pre-tax interest expense</td>
<td></td>
<td>67</td>
<td>109</td>
<td>116</td>
<td>123</td>
<td>130</td>
</tr>
<tr>
<td>Capital cash flow</td>
<td></td>
<td>563</td>
<td>605</td>
<td>708</td>
<td>818</td>
<td>934</td>
</tr>
</tbody>
</table>

**Terminal value**

5% 7,851
Table 6: The Valuation Impact of Each Risk Contingency Facing TT

<table>
<thead>
<tr>
<th>RISK CATEGORY</th>
<th>CHANGE IN PARAMETER</th>
<th>IMPACT ON TT’S VALUE (IN US$ MILLIONS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial Freedom</td>
<td>From 1 to 2</td>
<td>$1,000</td>
</tr>
<tr>
<td>Competitive Situation</td>
<td>From 1 to 2</td>
<td>$700</td>
</tr>
<tr>
<td>Tariff (Pricing) Structure</td>
<td>From 1 to 2</td>
<td>$1,000</td>
</tr>
<tr>
<td>Institutional Stability</td>
<td>From 0% to 3%</td>
<td>$1,200</td>
</tr>
</tbody>
</table>
Table 7: Monte Carlo Simulation Assumptions

Assumption: Managerial Freedom

Lognormal distribution with parameters:
- Mean 2.00
- Standard Dev. 0.40

Selected range is from 1.00 to 3.00

Mean value in simulation was 1.97

Assumption: Competitive Situation

Lognormal distribution with parameters:
- 10% - tile 1.75
- 90% - tile 2.26

Selected range is from 1.00 to 3.00

Mean value in simulation was 1.99

Assumption: Tariff (Pricing) Structure

Normal distribution with parameters:
- Mean 2.30
- Standard Dev. 0.10

Selected range is from 0.80 to 2.80

Mean value in simulation was 2.30

Assumption: Institutional Stability

Beta distribution with parameters:
- Alpha 3.00
- Beta 8.00
- Scale 10%

Selected range is from 0% to 7%

Mean value in simulation was 3%
Table 8: Monte Carlo Simulation Results

Forecast: Equity Value

Summary:
Display Range is from $3,500 to $7,000
Entire Range is from $3,589 to $6,714
After 1,000 Trials, the Std. Error of the Mean is $18

Statistics:

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trials</td>
<td>1000</td>
</tr>
<tr>
<td>Mean</td>
<td>$5,076</td>
</tr>
<tr>
<td>Median</td>
<td>$5,055</td>
</tr>
<tr>
<td>Mode</td>
<td>---</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>$555</td>
</tr>
<tr>
<td>Variance</td>
<td>$308,364</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.03</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.62</td>
</tr>
<tr>
<td>Coeff. of Variability</td>
<td>0.11</td>
</tr>
<tr>
<td>Range Minimum</td>
<td>$3,589</td>
</tr>
<tr>
<td>Range Maximum</td>
<td>$6,714</td>
</tr>
<tr>
<td>Range Width</td>
<td>$3,125</td>
</tr>
<tr>
<td>Mean Std.</td>
<td>$17.56</td>
</tr>
</tbody>
</table>
About the Authors: Paul M. Vaaler

Paul M. Vaaler is an Assistant Professor of International Business at the Fletcher School of Law & Diplomacy, Tufts University, Medford Massachusetts. He is also the Director of the Fletcher School’s Hitachi Center for Technology & International Affairs. At the Fletcher School, Professor Vaaler teaches in the strategy and international business fields with particular emphases on comparative aspects of technology management and management in newly-privatized industries. His current research interests include foreign investment risk-assessment and control in emerging-market countries and newly-privatized enterprises, particularly telecommunications, as well as the impact of new technologies on such enterprises. He is the co-editor of *Creative Destruction: Business Survival and Success in the Global Internet Economy* published by the MIT Press in 2001 (Paperback by the MIT Press in 2002, and Published in Hardcover in Japan by Toyo Kezai Press in 2002), and the co-editor of *Financial Innovations and the Welfare of Nations* to be published by Kluwer Academic Press in 2001. He also publishes in leading academic journals in strategy and international business including *Communications & Strategies* and the *Journal of International Business Studies*. He completed his Ph.D. studies in Strategic Management from the University of Minnesota’s Carlson School of Management in 1996. He also has a J.D. (Law) from the Harvard Business School and an M.A. in Philosophy, Politics and Economics from Oxford University where he studied as a Rhodes Scholar, and a B.A. in History from Carleton College in Minnesota. Professor Vaaler is a lawyer with experience in public and private practice. He has also served as a consultant to the US Federal Trade Commission’s Bureau of Economics.

About the Authors: Paul M. Vaaler

Lee McKnight is Associate Professor of International Communication and Director of the Edward R. Murrow Center at the Fletcher School of Law and Diplomacy at Tufts University; Visiting Scholar at MIT; Founder of the Internet and Telecoms Convergence Consortium; President of Marengo Research, a consultancy, and is a columnist for Mass High Tech. His teaching focuses on Internet and communications technology, economic and policy issues, international technology innovation, and telecommunications modeling. McKnight’s current research focuses on modeling the convergence of the Internet and telecommunications industries, the global Internet economy, international technology innovation policy, and Internet telephony policy. Lee is co-author of *The Gordian Knot: Political Gridlock on the Information Highway* (1997), and co-editor of *Creative Destruction: Business Survival Strategies in the Global Internet Economy* (2001), *Internet Telephony*, (2001), and *Internet Economics* (1997); all published by MIT Press. Peer-reviewed articles have appeared in *Telecommunications Policy, INFO, IEEE Internet Computing, Communications & Strategies*, Brazilian Electronic Journal of Economics, *Journal of Electronic Publishing*, and *Political Communication*. Dr. McKnight received a Ph.D. in Political Science in 1989 from MIT; an M.A. in International Relations from Johns Hopkins University in 1981; and a B.A. magna cum laude in Political Science and German from Tufts University in 1978. McKnight has been a Fellow of the Max Planck Foundation, the Friedrich Ebert Foundation, and the Volkswagen Foundation, among others.