Energy Investment Decision-Making Under Uncertainty: The Influence of Behavioral and Social Effects

– Extended Summary –

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Introduction

Risk perceptions [...] can become the most significant barriers to investment, even for renewable energy technologies that are cost-competitive with conventional energy-supply options.

– Sonntag-O’Brien and Usher (2004: 3)

Reducing dependence on fossil fuels and mitigating climate change are important policy objectives for countries throughout the world. One way to contribute to the achievement of these objectives lies in accelerating the deployment of renewable energy resources. This requires substantial financial investment from both the public and private sectors. According to the International Energy Agency (IEA), the transition from reliance on fossil fuels to power production from renewable energy will require about $3.6 trillion in additional investments over the next two decades (IEA, 2008). For numerous reasons, including the volatile price of oil, ongoing technological developments, and uncertainty related to public policy, there is considerable uncertainty surrounding these investments. The fact that renewable energy companies are often relatively young adds additional uncertainty for investors, which is a lack of information about historic financial performance. According to the United Nations Environmental Programme’s (UNEP) annual report on global trends in sustainable energy financing, however, total new investment in renewable energy has grown from $220 billion in 2010 to around $257 billion in 2011 – a total increase of around 17 percent (UNEP, 2012). Considering the global financial crisis that marked those years, that is quite a high number, but it is nevertheless only a fraction of what will be required to achieve the goals that have been set for clean energy deployment and carbon emission levels.

An as yet unsolved problem that is the subject of lively debate among both public policymakers and scholars within this field is thus how to decrease the high degree of uncertainty that is associated with renewable energy investment to encourage monetary investment in this market sector (IEA, 2007; Sonntag-O’Brian and Usher, 2004). Practitioners and scholars have focused specifically on the role that public policy plays in increasing investment levels, which, in light of the huge impact that public policy instruments such as subsidies, market-based incentives, taxes, and binding goals (e.g. for reducing emissions or increasing the use of renewable energy sources) can have on investors’ willingness to invest in that field, is justifiable. Governmental support has the capacity to promote and facilitate the growth of renewable energy markets, but it can just as easily negatively affect private investment through, for example, failure to set clear goals or by putting stop-and-go policies in place (IEA, 2007). The negative impact of policy risk on private investment in terms of economic (e.g. financial incentives such as feed-in tariffs) and non-economic (e.g. legal security, duration of the administrative process to get a renewable energy project permitted) barriers has been shown in different geographical contexts such as emerging economies (IWÖ-HSG, 2010), Europe (Breukers and

1 The total estimates of $9.3 trillion, also including $5.7 trillion for energy efficiency, correspond to 0.6% of the world GDP per year (IEA, 2008).
2 Compared to 2004 with a total spending of $39 billion global new investment grew enormously by more than six times till 2011; between 2007 and 2011 total new investment increased by 93% (UNEP, 2012).
An examination of the impact of policy risk reveals how immensely sensitive investors are to changes in the degree of overall risk and/or uncertainty surrounding an investment domain or specific investment target. Examining investors’ reactions to changes in public policy is nevertheless only one possible angle from which to study investor behavior in that field. Another approach would be to investigate how investors react to different behavioral or social effects in the market. The host of studies from the behavioral finance literature that provide empirically influence of psychological factors on investment decisions in general and especially under conditions of uncertainty (e.g. Barberis and Thaler, 2003; Kahneman and Tversky, 1979) lay the foundation for this viewpoint. Different studies have already shown behavioral effects in renewable energy investments. Chassot, Hampl, and Wüstenhagen (2011) provide empirical evidence suggesting that venture capitalists’ underinvestment in renewable energy deals can be explained by a policy aversion bias. Lüdeke-Freund and Loock (2011) show that banks’ financing decisions of large-scale photovoltaic projects is prone to a “debt for brands” bias related to the photovoltaic modules that are implemented in the project. Masini and Menichetti (2012) reveal that aside from a preference for policy instruments, a priori beliefs, and attitudes towards technological factors impact investors’ likelihood to involve themselves financially in renewable energy projects.

Building on this past research on the subject of behavioral effects on renewable energy investments, this doctoral thesis seeks to broaden the discussion in two specific ways: (1) through the examination of social effects on the decision whether to invest in this domain, which may stem from the actions of others within the investment sector (first and third paper); and (2) by examining behavioral and social influences in other sectors of the capital market and thus for other types of investors, such as individual (private) investors in public equity markets (second paper) and investors or banks engaged in very large-scale renewable energy projects (so-called “megaprojects”) (third paper).

Overview of the Papers

The first paper (Hampl Nina, Wuebker Robert, and Wüstenhagen Rolf: “The Strength of Strong Ties in an Emerging Industry: A Joint Test for the Effects of Status Hierarchies and Personal Ties in Venture Capitalist Decision-Making”; under 2nd revision with Strategic Entrepreneurship Journal) reports from a sample of 86 venture capital investors from the U.S. and Europe who each performed 3,132 choice tasks in an ACBC conjoint experiment. The study investigated how social networks influence investment decisions jointly testing for the influence of status hierarchies and personal ties in a context of high uncertainty (deals in the clean energy domain). This study, which is the first to examine these mechanisms, shows that both direct and indirect connections within networks measurably influence the decision-making process in venture capital investment. In the context of high uncertainty, however, personal ties – specifically, whether or not the deal came from a trusted referral in the investor’s network – are more important than the reputation of the other investors who are involved in the deal. These findings are in line with those of various scholars in this field (e.g. Shane and Cable, 2002). Further, the results indicate that personal ties wield a greater influence in the
densely networked U.S. venture capital industry than among the European respondents in the sample. They also reveal that investment experience has a U-shaped relation to the importance of strong personal ties, with the effect being strongest among inexperienced and highly experienced venture capitalists. The light that this study sheds on what is most important to venture capitalists, particularly in the context of an emerging industry, is of great import for entrepreneurs who are seeking to obtain funding for their ventures.

The aim of the second paper (Hampl Nina: “Invest in What You Know: An Experimental Approach to Investigating the Influence of Corporate Brands on Individual Investors’ Decisions”; under review at Journal of Economic Behavior & Organization) is to further our understanding of the corporate brand’s importance relative to other investment-related factors in stock purchase decisions, specifically under the condition of high uncertainty. Its findings derive from a ratings-based conjoint experiment that involved 1,044 experimental investment decisions made by 87 individual investors from Austria, Germany, and Switzerland. This study builds on previous research in this area (e.g. Barber and Odean, 2008; Frieder and Subrahmanyam, 2005; Huberman, 2001) and is in line with these scholars’ findings that (1) corporate brands indeed influence the investment-related decisions of individual investors and (2) familiar brands are more influential than lesser-known brands. This effect holds true for both of the industry contexts that this study investigates: the photovoltaic industry (high uncertainty) and the utilities industry (low uncertainty). The results, however, show that classical stock investment criteria such as growth in earnings, price development, management, and dividend payments are of the greatest relative importance to the average investor in this sample. The findings are of specific interest for representatives of the power and renewable technologies industries, as they expose how crucial the role is that marketing and branding play in these industry sectors, which in contrast to traditional consumer goods companies typically do not have large advertising budgets. In particular, the results suggest that companies in this sector should increase their corporate brand visibility on capital markets to generate interest among individual investors.

The third paper (Hampl Nina and Wüstehagen Rolf: “Management of Investor Acceptance in Wind Power Megaprojects: A Conceptual Perspective”; published in Organization, Technology & Management in Construction) introduces a conceptual model of investor acceptance of wind power megaprojects and suggests ways of managing investor acceptance based on insights from the literature on behavioral finance, social acceptance of wind power projects, megaproject management, and stakeholder management. This conceptual model could be used as a starting point for further investigation of the issue of investor acceptance in the context of wind power megaprojects, particularly for empirical studies such as case studies or surveys of investors and megaproject managers. Its findings contain valuable insight for both managers and investors in wind power megaprojects and other stakeholders such as policymakers and consultants. It might also have implications for other energy sectors (e.g. gas-fired power stations or pipelines, electricity transmission grids) or across infrastructure sectors (e.g. transportation) where investor acceptance plays a role.
References


