BUILDING EFFICIENCY BUSINESSES

(EVALUATING BUSINESS MODELS)

Msc. Ina SOKOLI

Department of Finance, University of Tirana, Rruga Elbasanit, Tiranë, Albania
ina.sokoli@yahoo.com

Abstract

This article provides context for the discussion of efficiency business models. It explains why rapid, cost - effective efficiency improvement has become a critical priority for the industry and the Nation. Also examines why regulated business are uniquely positioned to move markets for rapid efficiency improvement. The reasons are several, including the long-standing relationships of trust that businesses have with their customers, business' ability to realize large economies of scope and scale in the delivery of efficiency, and business' access to capital on terms that allow longer time horizons for investments compared to other market participants. To bring these strengths fully to bear, business need to pursue efficiency on a sustainable business basis.

Evaluating Alternative Business/Incentive Models, describes four business models representative of those that state regulators and policy makers have approved or are currently considering. There four models, along with simplifying assumptions, have been used to simulate rate and financial impacts. A business model covers both a shareholder incentive mechanism and a complementary approach to recovery of efficiency program costs and, perhaps, lost fixed revenues.

The common modeling and assumptions framework used to simulate the rate and financial impacts of all four of these business models. This framework is based on a simplified prototype business and its financial performance baseline and on a prototypical large scale efficiency program.

The common modeling framework and simple assumptions help to communicate the essential differences of the models by isolating the differing impacts of the four incentive approaches on the equity earnings, average rates, timing of cash flows, and other financial outcomes.

Keywords**:** efficiency, efficiency business models, Evaluating Alternative Business/Incentive Models, common modeling

1. Introduction

In recent years the strategy field has become increasingly interested in the study of business models. Although the expression was introduced long ago by Peter Drucker, academic work on business models began just a decade ago in the context of the Internet boom, where entrepreneurs were asked to explain how their ventures would create value and how value would be captured as profit. Indeed, the most common definition of business model is "the logic of the firm, the way it operates, and how it creates and captures value for its stakeholders."

Casadesus-Masanell and Ricart (2008, 2010, and 2011) and Casadesus-Masanell and Zhu (2010) operationalize this notion by decomposing business models into two fundamental elements: choices—such as policies, assets, and governance of policies and assets—and the consequences of these choices. The causal links between choices and consequences help explain the logic of the firm, how it creates and captures value for its stakeholders. These authors also propose a methodology to represent business models qualitatively.

While business model representations help improve an analyst's understanding of a firm's value logic, the methodology proposed offers little guidance on how the causal links between choices and consequences can be quantified. Without quantification, a detailed study of a firm's business model is incomplete because there is often too much freedom on how to interpret relationships between firm choices (such as low prices, heavy investment in technology, or high-powered incentives for managers) and their consequences (such as volume, bargaining power with suppliers, or a culture of frugality).

In this paper we propose a novel approach to quantify the link between a firm's choices and their consequences and, ultimately, for gaining a better understanding of the virtues and weaknesses of a firm's business model. The method builds on recent advances in production theory and index numbers by Grifell-Tatjé and Lovell (1999, 2008, and 2012) and relates business model choices to profit variations over time. Its starting point is the observation that profits raise and fall for two reasons: changes in either prices or quantities. In particular, a firm's profits could increase for any of the following reasons: (a) selling goods at higher prices; (b) paying less for inputs, such as labor or capital; (c) selling more goods while holding constant their cost markup; or (d) using fewer inputs per unit of good produced/sold. Note that (a) and (b) are related to prices whereas (c) and (d) are related to quantities. Our method quantifies how much of a firm's profit variation is due to price and how much is due to quantity effects.

These two effects, in turn, are determined through business model choices.

Indeed, the key to our approach is the realization that, at heart, business models create and capture value by acting on prices and volumes.

As noted, the analytical framework that we propose combines the theory of index numbers and production theory, uses publicly available information about realized prices and volumes, and has two levels of analysis.

The first level uses index numbers to produce an aggregated estimate of the price and quantity effects.

In particular, we build Bennet-type indicators for prices and quantities of inputs (e.g., labor and capital) and outputs (e.g., final products).

The price effect obtained through index numbers is useful to quantify, for example, the impact of business model policies that affect prices of inputs and outputs (e.g., product range or new supply sources) on profits. The quantity effect, in turn, captures the impact of policies that affect quantity (e.g., hiring more staff or investment in larger stores) on the bottom line.

The second level of analysis builds on new developments in production theory to decompose the quantity effect into an operational efficiency effect, a technological change effect, and an activity effect. To do this, we build on well-established techniques in production theory. This requires the assembly of a dataset that records information about other firms in the industry. We use production frontiers as reference points for computing the operational efficiency, technological change, and activity effects.

The operational efficiency effect measures how much profit variation over time is due to better use of input quantities; that is, how close the firm is to the production possibility frontier. The technological progress effect captures profit variation caused by the introduction of technological improvements that allow firms to produce with fewer inputs. Conceptually, technological progress corresponds to an expansion of the production possibility frontier. The activity effect measures how much the variation of profits over time is due to sales volume and the volume of inputs employed. This corresponds to a movement along the production possibility frontier. Our method quantifies these three effects. The additional level of detail obtained helps us better understand how a firm's choices leading to growth contribute to higher profits. It also helps us explore the effects of technological progress and the firm's efforts to achieve higher efficiency levels.

2. The Concept of Business Model

The notion of business model is recent in the scholarly literature. In the 1990s, as new ways of doing business that subverted established logics of value creation and value capture emerged, practitioners employed the phrase to describe the ways in which untried e-business ventures were to operate (Chesbrough and Rosenbloom, 2002; Magretta, 2002). The term was thus used to describe a wide diversity of novel, heterodox e-commerce firms.

While helpful to refer to "the logic of the firm," the notion is not free from controversy.

Porter (2001), for instance, has described the term as imprecise. This ambiguity has prompted many attempts to establish its boundaries and define its components. Mäkinen and Seppänen (2007) observe that most of these attempts were carried out in isolation from one another, which partially explains the current state of fragmentation in definitions. Magretta (2002) considers the terms "strategy" and "business model" not clearly separated and suggests that concerted efforts to define them should be made. More recently, Lecocq, Demil, and Ventura (2010) argued that the business model concept shows features of a research program based on Lakatos's viewpoint of scientific progress. In particular, the business model research program has a "hard core" (fundamental assumptions concerning an object), a set of "protective hypotheses" (hypotheses that are being debated and/or tested but do not yet constitute generally accepted assumptions), and it is "dynamic." Nevertheless, the authors claim that the theorization stage is still in its infancy and, to make progress, it is necessary to operationalize the concept. They conclude that new developments should aim at determining how business models must be observed, qualified, and measured.

Despite these objections, the concept of a business model is useful for integrating different, related elements. To Chesbrough and Rosenbloom (2002), for instance, a business model is a device that establishes a link between technological development and economic innovation. Hedman and Kalling (2003) regard the notion as an integrative concept that connects the resource-based view and the industrial organization perspectives on strategy. And Amit and Zott (2001) propose a unifying definition "that captures the value creation from multiple sources."

Although there are myriad definitions of "business model," for the most part they are similar. Magretta (2002), for example, defines it as a description of how the parts of a business fit together. Hedman and Kalling (2003) characterize the concept as a description of the key components of a business. The idea of business models composed of a predetermined collection of elements seems to be hovering over most definitions. Several studies have attempted to provide a definitive list of what a business model should include. Morris et al. (2005) and Hedman and Kalling (2003) examine diverse suggestions for the components of a business model. The range spans between three and eight elements. Morris et al (2005) suggest a business model concept that answers six questions and has three different levels, while Hedman and Kalling (2003) suggest seven components. The vocabulary employed to describe these components differs considerably from definition to definition, reflecting the lack of consensus among researchers.

In this study, we employ the conceptual framework developed by Casadesus-Masanell and Ricart (2010). According to this view, a business model is composed of two types of elements: choices made by the management and the consequences of these choices. There are three types of choices: policies, assets, and governance of assets and policies. Policy choices refer to courses of action that the firm adopts for all aspects of its operation. Examples include opposing the emergence of unions; locating plants in rural areas; encouraging employees to fly tourist class, providing high-powered monetary incentives, or airlines using secondary airports as a way to cut their costs. Asset choices refer to decisions about tangible resources, such as manufacturing facilities, a satellite system for communicating between offices, or an airline's use of a particular aircraft model. Governance choices refer to the structure of contractual arrangements that confer decision rights over policies or assets. For example, a given business model may contain (as a choice) the use of certain assets such as a fleet of trucks, which leads onto a governance choice for the firm as to whether it should own the fleet or lease it from a third party. Consequences can be flexible or rigid. The flexibility of a consequence is determined by how fast it changes as the choices that produced it vary.

Casadesus-Masanell and Ricart's framework is simple, flexible, and bridges industrial organization and the resource-based view, two alternative perspectives for the study of competitive advantage. According to the resource-based view, what determines a firm's success is control over valuable, rare, and imperfectly imitable resources (Barney, 1991). The industrial organization perspective, developed by Porter (1980, 1985), portrays the firm as a collection of activities on which competitive advantage resides. This author describes two generic strategies (low cost and differentiation) that translate into homonymous types of competitive advantage. Casadesus-Masanell and Ricart (2010) and Zott and Amit (2010) recognize the importance of activities (policies) and assets as descriptors of a firm's business model. And, by incorporating the governance of assets and policies, Casadesus-Masanell and Ricart (2010) also consider insights from transaction cost economics.

The framework has two important additional elements. First, there is the idea that consequences are sometimes rigid—meaning that some choices made by the firm have a cumulative effect. This provides the "longitudinal dimension" explicitly sought by Hedman and Kalling (2003). The second element is the inclusion of causal relationships between choices and consequences. Choices produce consequences. Furthermore, consequences may create other consequences, or enable choices. The causal loop diagram is the device proposed to represent business models.

A feedback loop occurs when the consequences of some choices also make these same choices possible. Virtuous cycles are "feedback loops that in every iteration strengthen some components of the model."

This second element can also be found in the dynamic RCOV framework developed by Lecocq, Demil, and Warnier (2006).

These authors identify three different components to every business model: resources and competencies (RC), internal and external organization (O), and a value proposition (V). These components are linked creating virtuous cycles.

The level of detail in each business model depends on the objectives of the practitioner or researcher. It is important to bear in mind the tradeoff between tractability and realism mentioned by Casadesus-Masanell and Larson (2009) when choosing the degree of precision in the representation. Casadesus-Masanell and Ricart (2008, 2010) describe two methods of simplifying a business model representation. One is aggregation, which consists of grouping choices and consequences into larger constructs. The other is decomposability, which refers to the analysis of parts of a business model that are not related to other choices and consequences. In what follows, we make use of aggregation and decomposability.

3. Defining the business model

A particular set of choices affects the success or failure of a business model:

1. Pricing: Discount retailers determine the prices of their merchandise and whether or not to price discriminate.
2. Pressure over vendors: Discount retailers choose how much pressure to exert over vendors to obtain favorable terms and conditions. They also look to build mutually beneficial partnerships with suppliers with the goal to create more value.
3. Investment in technology: Discount retailers choose how different tasks are executed. At one extreme, they may incorporate the latest technologies in their daily processes (investments in satellite systems, uniform product codes, RFID…) and, at the other, may follow "artisanal" procedures (e.g. manual inventory systems).
4. Human resource practices: Discount retailers set different policies that characterize their relationships with employees: compensation policies, power of incentives, screening of new employees, and so on.
5. Expansion policies: Discount retailers choose whether to locate their stores in rural, suburban, or urban areas and the rate at which new stores are added to the company.
6. Product selection: Discount retailers must choose the mix of goods they sell: private labels vs. national brands, selection of product categories, and selection within categories.
7. Cost consciousness: Discount retailers seek to minimize overhead expenditures to boost profits. However not all retailers do it the same way or with the same intensity. For example, some have lavish headquarters while others choose austere offices.
8. Customer service: Discount retailers choose how to treat their customers. Some retailers create a family atmosphere where customers are welcomed to the premises and persuaded to buy certain articles or actively handheld. Others offer more leeway and only interact directly with customers if they demand information. The "customer service" lever also includes store appearance, customer support, return policy, and complaint management.

4. Quantifying the Effect of Business Model Choices

We now present a method that relies on the theory of index numbers and production theory to assess the impact of choices on the evolution of profits over time. The purpose of index numbers is to aggregate information. Production theory allows us to study the effect of technical change, operating efficiency, and the level of activity on profit. Contrary to

neoclassical approaches to the analysis of the firm, our framework does not require the assumption of profit maximization. The method that we propose has two levels of analysis. The first level uses publicly available information on prices and quantities to explain variation in profits through index numbers. The price effect measures the impact of policies affecting input and output prices on profits. The quantity effect measures the impact of decisions on output or input quantities on profits. Recently, Boussemart et al. (2012) present a method that uses index number theory to compare profits between different firms. Hence, index numbers are useful not only to evaluate the effectiveness of a particular business models and its implementation but also to understand interactions among competitors.
The second level of analysis decomposes the quantity effect. To do this, we introduce concepts like the set of production possibilities and the production possibility frontier.
Production theory allows us to explain the quantity effect using well-known economic performance measurement concepts. This level of detail helps us understand how growth policies contributed to higher profits. In addition, we can explore the effects on profits of technological progress and efforts to achieve higher efficiency levels. The empirical application of this second layer of analysis requires the construction of a dataset with information about other firms in the retailing industry.
The rest of this section provides technical details on both levels of analysis.

(A) First Level

The first level of analysis decomposes change in profits into a quantity effect and a price effect. We define profit (π) as the difference between revenue and operating cost where revenue is given by $\mathrm{R} = \mathrm{p}^{\mathrm{T}} y = \sum p_m y_m$ and operating cost by $\mathrm{C} = \mathrm{w}^{\mathrm{T}} x = \sum w_m x_m$. Output vectors are represented by $y = (y_1, ..., y_M)$ and input vectors by $x = (x_1, ..., x_N)$. In addition, output price vectors are denoted $p = (p_1, ..., p_M)$ and input price vectors $w = (w_1, ..., w_N)$. Profit is expressed as $® = R - C = p^T y - w^T x$, and profit change, from period t to period t+1, is defined as

$$®^{t+1} - ®^{t} = \left[\overline{p}^T (y^{t+1} - y^t) - \overline{w}^T (x^{t+1} - x^t)\right] + \left[\overline{y}^T (p^{t+1} - p^t) - \overline{x}^T (w^{t+1} - w^t)\right] \quad (1)$$

The vectors $\overline{p}, \overline{y}, \overline{w}$ and $\overline{x}$ are averages of current and next period vectors, where $\overline{p} = \frac{1}{2}(p^t + p^{t+1}), \overline{y} = \frac{1}{2}(y^t + y^{t+1})$ and so on. . The first term on the right hand side of expression (1) is the quantity effect, showing the impact of quantity changes on profit change. The second term is the price effect, which shows the impact of price changes on profit change. Each expression has two components. In the case of the price effect, the first component, $\overline{y}^T (p^{t+1} - p^t)$ quantifies the variations in the prices of outputs; as we discuss below, in our application this is the change in value added per unit of output. The second component, $\overline{x}^T (w^{t+1} - w^t)$ measures the impact on profit of variations in input prices. Equation (1) expresses changes in profit using Bennet quantity and price indicators.

(B) Second Level

Using production theory (see Grifell-Tatjé and Lovell, 1999, 2008, 2012 and De Witte and Saal, 2010), the second level of analysis further decomposes the quantity effect into an activity effect, an operating efficiency effect, and a technical change effect:

$$\bar{p}^T(y^{t+1}-y^t)-\bar{w}^T(x^{t+1}-x^t)=\left[\bar{p}^T(y^{t+1}-y^t)-\bar{w}^T(x^C-x^B)\right] \quad \text{Activity effect}$$
$$+\bar{w}^T(x^t-x^A)-\bar{w}^T(x^{t+1}-x^C) \quad \text{Operating efficiency effect}$$
$$+\bar{w}^T(x^A-x^B) \quad \text{Technical change effect}$$

The operating efficiency effect measures the change in the difference between the chosen amount of inputs to produce the observed level of output and the efficient amount of inputs needed to produce that level of output. To produce a cost valuation of the operating efficiency of the firm, we multiply these differences in inputs by the Bennet input price index, $\bar{w}$.
The technical change effect measures the change in the efficient amount of inputs needed to produce output y^t when moving from technology F^t to technology F^{t+1}. To produce a monetary valuation that we can relate to the evolution of profits, we multiply the change in efficient input combinations by the Bennet input price index. Productivity is defined as the sum of operating efficiency and technical change effects (Grifell-Tatjé and Lovell, 1999).
The calculation of the activity, operating efficiency, and technical change effects require estimates of the unobserved input vectors: x^A, x^B, and x^C. These vectors lay on the frontiers F^t and F^{t+1}. We now show that these vectors can be expressed in terms of observable inputs and easy-to-estimate distance functions.
We define the same-period input distance function as $D^t(y^t,x^t) = \max\{\theta: (y^t, x^t/\theta) \in F^t\}$.
We have that $D^t(y^t,x^t) \geq 1$ because when x^t is producing the maximum feasible output with period t's technology ($x^t \in F^t$), we have $\theta = 1 = D^t(y^t,x^t)$. The adjacent-period input distance function $D^{t+1}(y^t,x^t)$ is obtained by replacing F^t with F^{t+1}. Because some input/output combinations in period t+1 may not be feasible under period t's technology, we have that $D^{t+1}(y^t,x^t)>, =, <1$.
Input vectors x^A, x^B, and x^C are radial expansions of the observed quantity vectors (x^t,y^t) and (x^{t+1},y^{t+1}). It is easy to see that the technically efficient period t input vector x^A can be expressed as $x^t/D^t(y^t,x^t)$. Likewise, the technically efficient period t+1 input vector x^C is given by $x^{t+1}/D^{t+1}(y^{t+1},x^{t+1})$. Finally, x^B is a radial scaling of x^t to the boundary of F^{t+1}; therefore, $x^B= x^t/D^{t+1}(y^t,x^t)$. Thus, if we calculate the input distance function D(x, y), we will be able to produce estimates of x^A, x^B and x^C, which is all we need to compute the activity, operating efficiency, and technical change effects.

Conclusions

The aim of this paper has been to contribute to the extant literature on business models.

We have argued that business models are composed of levers and that a central task of the top management team is to choose on how to configure (i.e., pull) each lever. Part of the reason why we often observe heterogeneity of performance of companies with similar business models is that management has chosen to configure business model levers differently. Overall, our analysis suggests that the effectiveness of a particular business model depends not only on its design (what levers are part of the business model) but, most importantly, on its implementation (how each lever is configured).

The literature is rich in theoretical frameworks that help analysts describe business models qualitatively, but little progress has been made in developing micro-founded methods to quantify business model performance. Ours is a first step in this direction. The method we propose provides a clear assessment of the impact of a company's choices on profits. We rely on theory of index numbers and production theory. Production theory provides the fundamentals required to define and quantify concepts central to strategy such as productivity, technical change, or operating efficiency in the context of economic performance assessment.

These are linked to consequences of firm choices and are naturally used as explanatory variables of profit change, our measure of performance. One strength of our approach is that we do not assume that firms maximize profits as none of our derivations relies on this assumption (which is controversial in strategy).

One important limitation of our analysis is that although we have included competitors in building the production possibility frontier, we have not considered explicitly the effects of interactions with competitors on profitability over time. For tractability reasons, we have not looked at explicit interactions between competitors and we leave this issue for further research. However, we should also say that the fact that chose to operate in dispersed, rural locations also meant that it interacted less with other discount retailers. Walton acknowledged in his memoirs that this strategy shielded from competition.

References

Amit, R., & Zott, C. (2001). "Value creation in e-business." Strategic Management Journal, 22, 493-520.

Baden-Fuller, C., I. MacMillan, B. Demil, X. Lecocq. (2008). "Special Issue Call for Papers: Business Models." Long Range Planning.

Balk, B. M. (2008). "Searching for the holy grail of index number theory." Journal of Economic and Social Measurement 33(1), 19-25.

Brandenburger, A. & Stuart H. W. (1996) "Value-Based Business Strategy" Journal of Economics & Management Strategy, 5(1), 5-24.

Casadesus-Masanell, R., & Feng Zhu (2010). "Strategies to fight ad-sponsored rivals." Management Science, 56(9), 1484-1499.

Casadesus-Masanell, R., & Larson, T. (2009). "Competing through business models (D)." Harvard Business School, Case 710-410.

Casadesus-Masanell, R., & Ricart, J. E. (2008). "Competing through business models (A)." Harvard Business School, Case 708-452.

Gold, B. (1971). Explorations in Managerial Economics. Productivity, Costs, Technology and Growth. Basic Books Inc: New York.

Grifell-Tatje, E., & Lovell, C. A. K. (1995). "A note on the Malmquist Productivity Index." Economic Letters, 47(2), 169-175.

Walton, S. (1992). Sam Walton: Made in America, My Story. New York: Doubleday.

Williamson, O. (1981). "The economics of organization: the transaction cost approach." The American Journal of Sociology, 87(3), 548-577.

Wilson, P. W. (2008). “FEAR 1.0: A Software Package for Frontier Efficiency Analysis with R,” Socio-Economic Planning Sciences 42, 247-254.
Zott, C. and Amit, R. (2010). “Business model design: an activity system perspective.” Special Issue on Business Models, Long Range Planning 43(2), 216-226.
Zott, C., Amit, R., and Massa, L. (2010). “The business model: Theoretical Roots, Recent Developments and Future Research,” IESE Working Papers Series, WP 862.