

Success criteria for Commodities Exchanges

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Abstract: Abstract

Commodities Exchanges have become important, even vital, ingredients in agricultural commodity pricing and the development of agricultural marketing systems worldwide. Whilst both the pre-requisites for their success and the obstacles in their way have been substantially researched, this article seeks to fill the prior gap in knowledge, how their success is and should be measured by each of the major stakeholders – government, shareholders, and Exchange management themselves. The conclusion drawn is that although they are now for the most part profit-making institutions, management at Commodities Exchanges continue to rely on quantitative measures more appropriate to mutually owned or public sector institutions. They should instead draw on conventional finance literature to derive criteria for the success of both individual contracts, and themselves overall. At the same time, this should result in government recognising that agricultural derivatives contracts may fail the hurdles imposed by conventional criteria of profitability, in turn demanding a redefinition and calibration of public policies towards the success of Commodities Exchanges and the contracts they launch.

Key words:

Commodity Exchanges, risk management, public policy, firm performance criteria

JEL classifications:

Q02 Commodity Markets, D22 Firm Behavior: Empirical Analysis, G28 Government Policy and Regulation

Commodities Exchanges and why they matter

A Commodities Exchange may be defined as a physical or – more likely – electronic marketplace for buying, selling and trading commodities, whether ‘hard’ commodities - typically natural resources that must be mined or extracted (gold, rubber, oil, etc.), or ‘soft’ commodities, which are mainly agricultural products or livestock (coffee, corn, cotton, sugar, soybeans etc.). The purpose of the Exchange is to provide an organised and reliable marketplace where Exchange members can trade commodities on behalf of their clients, which can range from farmers to speculators. The Exchange acts as an intermediary, removing credit risk between its members by interposing itself between buyers and sellers. Some Exchanges trade commodities for spot or forward delivery, whilst others provide futures and options which are financial Exchange for price risk management where deliveries are rare or settlement is in cash (Gross, 2014). Exchanges operate under a regulatory framework approved by government.

There are currently almost a hundred major commodity markets worldwide that facilitate one or another kind of derivative trade in nearly a hundred primary commodities, although significantly fewer regulated commodities Exchanges (Belozertsev, 2011, and author research). In the majority of cases, however, commodities (especially softs) now form only a part of the business of the Exchange: the majority of contracts traded are financials such as shares or interest rate, currency or other financial derivatives. Yet despite their relative insignificance for large integrated Exchanges, the importance of commodity derivatives to commodities trade worldwide, and the potential commercial opportunities offered by Exchanges, is evidenced by the fact of the steady growth in the number of commodity Exchanges and Exchange-traded commodity contracts (UNCTAD, 2006, Gross, 2014, Jyothi & Rao, 2017), as well as Over-the-Counter contracts which frequently rely upon Exchange prices. Radetzki (2013) identifies several aspects of commodity Exchange development that have militated in favour of their increasing dominance in price-setting, including in many emerging markets: (1) There is a strict standardization of contract terms e.g. volumes, qualities, delivery times, margins and payment terms. (2) Futures transactions exhibit a high degree of transferability (i.e. liquidity) and (3) The existence of

a clearing house, established and financially guaranteed by its members, operates to minimise risk in dealing with counterparties in derivative trading on an Exchange (Radetzki, 2013:269).

What makes for a successful commodity Exchange?

Establishing a commodities Exchange is not cheap, nor is launching a new contract (Jayne et al, 2014). Moreover, a number of Governments, such as Ethiopia and India, have at varying times placed considerable trust in Exchanges to deliver part, at least, of their agricultural policy agendas (Gabre-Madhin, 2012, Bhagwat & Maravi, 2015). Whether a commodities Exchange succeeds or not is therefore an important question. Pre-requisites for success as well as potential obstacles and pitfalls have been well documented in the literature (Black, 1986, Brorsen & N'Zue, 2001, Rashid, 2015). Factors identified as necessary for a successful commodity contract include an adequately large supply and demand for a fairly standardised commodity, relatively transparent determination of prices, wide price fluctuations, a well-functioning spot market, a widespread perception of the absence of distortions in price setting (e.g. by collusion), and differentiated market participants (e.g. traders, brokers, bankers, producers, and manufacturers), who working together with the Exchange can create the necessary liquidity, adequate IT and physical infrastructure for trading, grading, storage, transport, and appropriate legal and regulatory systems. No doubt this list of pre-requisites for success is fairly comprehensive. But before all this, there ought to be a prior question: *what criteria could, are and should be used to determine the success of an Exchange, or the contracts it launches?* The answer to these criteria might in turn influence the balance between the answers in the list of necessary factors for success.

There are three different potential interest groups with different perspectives on the success of a commodity Exchange.

Public policy success criteria for Exchanges

From the standpoint of policy-makers who approve of them in principle, notably international agencies such as the World Bank which have actively supported them since the early 1990s (Claessens &

Duncan, 1993), commodity Exchanges are explicitly designed to address a wide range of challenges facing African food markets (Gabre-Madhin and Goggin, 2005) and are likewise a part and parcel of a program for agricultural liberalisation in India (Bhagwat and Maravi, 2015:12). By offering a platform for competitively matching a broad range of buyers and sellers, those supporting them contend that commodity Exchanges can reduce inefficiencies of agricultural marketing by streamlining trading, delivery and payment systems and by providing more accurate price information to all, stimulating market transparency and price discovery, thereby attenuating (speculative) bubbles and price volatility, in turn lowering the potential for collusion among market actors (UNCTAD, 2009; Rashid et al., 2010; Poulton et al., 2006; Gabre-Madhin & Goggin, 2005, Sitko & Jayne, 2012). For their supporters in government, and notably in the international agencies such as the World Bank that have promoted them, commodity Exchanges can also reduce transaction costs by expanding the range of potential trading partners, providing industry approved inspection and quality certification services, and providing contract enforcement and arbitration services to protect against default (Gabre-Madhin & Goggin, 2005, Sitko & Jayne, 2012). With respect to value chain finance specifically, a commodity Exchange can run a warehouse receipt system, enabling farmers and co-operatives to have liquid collateral against which banks and other financial institutions banks can lend (Gross, 2014). Viewed from a national perspective, the benefit of commodity futures Exchanges, apart from any prestige they may confer upon a developing country, is mainly twofold: firstly, it supports and improves the nations' trading in physical commodities, and secondly, it provides useful price information to market participants – not only to those who are currently trading on the Exchange, but OTC and spot market traders as well. Moreover, they are part of a regulatory, governance and legal system that creates and enforces property rights, contracts and other aspects of a developing economy that Governments favour. Finally, it has been contended that far from destabilising prices, commodities Exchanges stabilise markets around equilibrium levels and avoid misallocations of scarce resources at the cost of higher price variability compared to traditional, expensive, difficult-to-administer governmental price support programs (Zimmermann & Haase, 2016:7-8). All of this can increase margins for farmers, in turn raising agricultural productivity.

It should be recognised that commodities Exchanges are not without their critics, some of whom broadly take the view that food and energy prices should not be left to the market to decide (Clapp, 2017). Others, who support market mechanisms in general, have however alleged that Commodities Exchanges have raised transaction costs, possibly generated greater price fluctuations, failed to provide adequate and efficient warehouses, and demonstrated a lack of transparency in their operation, including conflicts of interest by brokers, such as allegedly in Zimbabwe (Rashid, 2015). In developing countries, aside from criticisms, they have also suffered from lack of economies of scale, resulting in joining costs being too high, especially for local institutions (Jayne et al, 2014). Poor decision-making by management resulting in overly complex or poorly specified contracts or high operating costs can also result in the failure of Exchanges and the contracts they launch (Mbeng Mezui et al, 2013, Bjerga & Davison 2015). Critics have either concluded pessimistically that Commodities Exchanges in developing countries are not fit for purpose (Robbins, 2016:22), or have more optimistically drawn up an action plan to remedy perceived deficiencies (Ahmed, 2017:24).

All this amounts to a contribution, albeit one with a mixed message that may be hard to determine exactly, let alone determine proper policies at the level of government, to agricultural production efficiency in a country. There can be little doubt that many Governments view this potential outcome favourably, even if they are often derailed by short-term political considerations such as a demand for low food prices, restrictions on exports at times of shortage, problems with local supply, or other significant obstacles to their efficient operation, especially in developing countries. Many of these criticisms of Exchanges have however also permeated through to government, especially when transparent prices are themselves a cause of concern, either for broadly political reasons or less savoury matters of local political interest. Sometimes this leads to a chequered history of restrictive legislation, as in India, or even shutting commodity derivative trading in individual commodities, as was the case with rice futures in Thailand in 2016: although in a globalised economy, none of these measures could be expected significantly to affect world prices.

The inconsistencies and changes in many governments' policy towards derivatives may derive in part from a key problem: *the actual net benefits derived from an Exchange have rarely been quantified by*

Government. Everything is either anecdotal or the evidence is mixed, even for the impact of commodity Exchanges contracts on something as empirical as volatility. IFPRI analysts have suggested that if a commodity Exchange adds value to the market, it should be reflected in price behaviour through improvement in the price transmission and integration across space and times, particularly between international and local markets. But their study of the Ethiopian Commodity Exchange ECX using an MGARCH model demonstrated little such improvement (Hernandez et al, 2017). Similarly, studies of commodity price volatility in Thailand before and after the introduction of commodity futures demonstrated little correlation between futures volumes and underlying spot market price volatility (Pinjisakikool, 2009), whilst a similarly mixed message has emerged from several Indian studies (Ul-Haq & Rao, 2014, Jyothi & Rao, 2017). Moreover, Exchange development is uneven and it is known that contracts are not always traded by their target market: for example, NCDEX, the largest farm commodity Exchange in India, has around 163,000 farmers registered, but only 33,000 have traded, a level of participation (20%, which is not necessarily at any one time) which has been described as ‘dismal’, given that around half of the workforce is still in agriculture (Financial Express, 2017). The conclusion must therefore be that traded volumes and open interest alone are clearly insufficient public policy measures by which to judge the success of a Commodities Exchange. Only systematic study of the value chain can indicate the effect of the Exchange on the public policy indicators that matter, such as transparency and shifts of profitability up the value chain towards farmers themselves.

Because on the evidence it is impossible to trace through accurately how an Exchange delivers these kinds of public policy advantages, there are, perhaps very regrettably, and despite the considerable investment made by the public sector in Exchanges, no documents publicly available on what quantitative criteria of success Government have or ought to use for Commodity Exchanges. The suspicion remains that Governments, especially in developing countries, have at varying times favoured Exchanges in much the same way that they did airlines in a previous era, as testimony to development success in their own right, irrespective of any analysis of their actual contribution to the agricultural sector (Bjerga and Davison, 2015)

Private sector criteria – a company like any other

The second and conflicting perspective is that of the shareholders of the Exchange. When established, the majority of Commodities Exchanges were mutual institutions, operated without profit for the benefit of their members, which were largely commodities trading firms, some with long-vanished names associated with defaults on Exchanges such as Woodhouse, Drake and Carey (1991) and Refco (2005). Since that time however, a majority of Commodities Exchanges have become independent private or listed companies with independent shareholders. In allowing private sector Exchanges, and further in permitting them to demutualise, Government is implicitly supporting an ideology of free trade: from this perspective, greater competition between Exchanges and the profit motive of members or the Exchange itself are the best way to ensure the achievement of the Government's own objectives for the sector. Rarely, however, are public sector objectives achieved without effective regulation (Dentoni & Dries, 2015).

For any profit-making company, it is important to distinguish success criteria from both the *evidence* of success and the *reasons* for success. Purely evidential matters will probably at least include satisfaction expressed by regulators and government, retention and renewal of licences to operate, favourable press comment, ease of staff recruitment and good retention rates, no scandals, rising volumes and open interest numbers, and growing market share. Evidence of events such as takeovers with clearly demonstrated synergies or the launch of successful new contracts (however defined by the Exchange) can also be considered under this heading. None of these can be considered success criteria themselves. Likewise, the reasons for success, whether competent management, supportive government, or the efficient delivery of the Exchange's services, are not criteria for success. It is true that 'Exchanges can be privately profitable when market actors are willing to pay for three important services: (i) improving price discovery, (ii) increasing market liquidity, and (iii) helping price risk management' (Rashid, 2015:2) but this is almost – but not quite – an inevitability, not a set of performance criteria.

Large and growing volumes and open interest numbers were success criteria in themselves prior to demutualisation, when costs were controlled only by the administrative intervention of the member firms of the Exchange. After demutualisation, however, conventional financial criteria for the success

of the company apply. These have been suggested to be: i) conduct trade and ii) generate enough revenue to profitably pay for their operations (Rashid, 2015:4). Profits allow for dividends and feed through into share price performance: studies have used the response of share prices to analyse e.g. whether although Stock Exchanges are heavily regulated mergers create value for their shareholders (Hasan et al, 2012:473). One problem with this measure is that any share price is heavily influenced by macroeconomic factors that affect the entire share market. Another is that the short-term response of share prices may be contradicted by longer term price movements. Finally, share price changes exclude dividends, which can only be theoretically defensible if they are held to include expectations of future dividend movement. A much more obvious and clear objective for shareholders is Total Shareholder Return (TSR) – the combination of dividends and capital appreciation. This is virtually a tautology: why would shareholders in a private sector environment want anything else, unless they were motivated by wider stakeholder concerns? In that case, they might turn to other criteria, such as the Balanced Scorecard, or an admixture of TSR and corporate social responsibility (CSR). The complex issues associated with the unconsidered use of total shareholder return (TSR) as a metric to represent the gains (or otherwise) in shareholder wealth and in contexts such as long-term incentive compensation and proxy voting by shareholders (including “say on pay”). Not all TSR is created equal. Other measures, such as economic profit (EP), return on invested capital (ROIC), and future value (FV), need to be introduced to effectively interpret the quality of TSR. ‘Simple performance metrics are always attractive. But the fact that a performance measure is simple does not make it useful, especially if it is represented as measuring something it does not really measure and then used to justify outcomes advantageous to the measurer ‘ (Burgman & Van Clieaf, 2012:26).

Even if they are entirely financially focused, shareholders face a further issue in comparative analysis. When markets as a whole are doing well, the value of Exchanges rises along with the market. Whilst for many companies a more sophisticated approach based on ‘arguing for alpha’ is entirely plausible, the problem for shareholders in commodities Exchanges is that only rarely are they presented with direct competitors. They are forced to make investment decisions in a fog.

Management success criteria for Exchanges

The third perspective is that of the Exchange management themselves. Prior to demutualisation, these objectives may be fundamentally organisational, typical success criteria for public organisations, co-operatives, associations and even charities. Primarily, apart from survival of the Exchange, management used ‘empire building’ criteria: growth of turnover, open interest and successful contract launch as a measure of success, especially as Exchanges are usually funded by a levy on each contract traded (Roche, 1992). More recently this has also applied to Exchanges in developing countries. For example, in the early years of ECX, management pointed to the fact that ECX linked 2.4 million smallholders through cooperatives; that ECX trade volume increased from a modest 138,000 tons in the first year to 508,000 tons in the third year; and that in February 2011, ECX celebrated ‘1000 days of ECX, US\$1.0 billion in trades, and zero defaults (Gabre-Madhin 2012). ECX was further described as relatively *successful*, having reached a total trade of US\$ 8 billion from its inception in 2008 to early 2013 (Mbeng Mezui et al, 2013:22). These success criteria were appealing alike to ECX management, policymakers, and development partners and the media alike). Several academic contributions themselves also implicitly use very broad policy criteria for success. Hence Sitko and Jayne (2012) in analysing why African commodity Exchanges are ‘languishing’ provides evidence in terms of low comparative contract volumes between ZIMACE and SAFEX, the former admittedly not demutualised. ‘Languishing’, then, means low trading volumes, and presumably, success would mean larger trading volumes. Similarly in an analysis of the ‘performance’ of Indian Commodity Exchanges (Bhagwat & Maravi, 2015), statistics provided are of volume growth over time. It should be recognised, however that mere traded volume is a poor indicator of success from a public policy standpoint, for four reasons: traded volume may reflect day trades or even market crosses (simultaneous buying and selling) which do not permit hedging or trading by farmers. A variant on the quantitative measure of success is the level of open interest, which can be interpreted as a measure of ‘involvement’ or ‘commitment’ to the Exchange by its trading members.

Evidently, management criteria are closely linked to the first set, those of Government and the development community generally. It would be premature, however, to conclude that they are identical. Most obviously, Exchange statistics on trade volume do not differentiate speculators from the end-users,

whose use of the Exchange government wishes to promote. A second set of management success criteria relate to the size of membership. This can be viewed as a form of diversification strategy and risk management: the loss of any one member will be less significant for the Exchange. Similarly however, these criteria may not much relate to public policy objectives, as members may be catering mainly to speculators, not actual spot market participants.

A problem with both of these approaches to ‘success’, moreover, is how to account for mergers between commodities Exchanges. A second problem is that all Exchange members are not created equal - small members may trade infrequently, if at all. Thirdly, and conversely, Exchange trade volumes do not reflect any risk of their future reduction or disappearance. If one member is undertaking a significant percentage of the Exchange’s trades and is operating under financial stress or some other threat to its existence -and the evidence suggests that member bankruptcies and disappearance is by no means unknown – then historical and even recent traded volumes may be no accurate guide to the future success of the Exchange.

Such quantitative criteria for management were success criteria in their own right, before demutualisation, but for a public company, these constitute indicators of success, not the real thing. They can also put out conflicting signals. Finally therefore, Exchange management may now share shareholders’ objectives by implementing financial criteria for success, and demutualisation provides the opportunity to fix on a set of obvious success criteria that are much easier to study: profitability. These measures, whether taken at the gross or net level, and whether before or after tax, have the advantage that they are publicly available and recorded annually. They are, however, subject to a raft of problems connected with accounting standards, timeframes, and the lack of firm basis in the cashflows that will eventually determine the survival of the firm and its ability to deliver shareholder value. Most analysts have therefore long agreed that as a valuation measure, profit is woefully inadequate (e.g. Rojo-Ramírez, 2014).

Analysts recognise instead that the best, long-term performance criteria for management to deliver TSR for shareholders is for the return on their investments, whether measured as Return on Capital Employed

(ROIC), Return on Equity (ROE), or Return on Invested Capital (ROIC). Traditionally, the yardsticks used to measure the efficiency and profitability of a business organization were accounting based measures like Return on Investment, (ROI), Return on Equity (ROE), Return on Capital Employed (ROCE) – all of which must exceed target cost of capital levels - Earnings Per Share (EPS), gross and net profit. In addition value added concepts such as Economic Value Added (EVA_{tm}) have gained considerable traction as firm performance criteria (Chauhan & Patel, 2013:5).

All of these measures are generally recognised as being improvements on one year's profitability, but they have the disadvantage that they are scale-independent. There are many refinements on this theme, notably including risk, but the real problem for all firms comes in operationalising these requirements. In practice, management usually seeks to implement the objective of returns to equity exceeding the cost of equity by conducting Net Present Value (NPV) analyses, which have the benefit that in considering NPV as well as IRR scale is reintroduced into decision-making. It is also important to recognise that whether considering NPV, IRR or even accounting profit, it is after-tax cashflows that should be considered. Hence any tax incentives from which an Exchange may benefit are relevant. For example in Rwanda, there is an 'investment allowance' which allows the expensing initial investment, whilst newly listed companies on the Rwanda Stock Exchange are also granted a partial tax holiday depending on the percentage of shares listed (Zangrandi *et al*, 2012). Finally, and from government's policy perspective perhaps most important, there is no reason not to include any subsidy provided from the public sector within an NPV/IRR analysis.

This is theoretically satisfactory, but there are formidable and possibly insurmountable difficulties in using NPV and IRR criteria to evaluate success for an Exchange. First, shareholders themselves are virtually incapable of performing effective NPV analysis on any company as they usually lack access to forecast data or the business plan based on them; Exchanges are certainly no exception to this. Management never reveals its NPV analyses to shareholders, no more with Exchanges than any other business. Second, in common with many companies, Exchanges face significant fixed costs. Launching new contracts, especially on electronic platforms, is relatively inexpensive. The NPV for any contract, viewed – as it should be – as a marginal cost and benefit calculation – is highly likely to be positive.

Why not, therefore, launch as many new contracts as the Exchange has resources to manage? The reason why not lies in the reputational risk that failed contracts create, which is difficult to replicate in terms of NPV, IRR or any other direct financial criterion.

Theory collides with practice, then, which suggests that Exchange management face an almost impossibly difficult task in reconciling conflicting objectives and performance measurement criteria: As Rod Gravelet-Blondin, former commodities director at the Johannesburg Stock Exchange, is reported to have said at the Association of Futures Markets Conference in 2017: ‘it is important not to lose the focus of our role: which is to provide risk management tools for real economy products’ What happens in practice?

Empirical Analysis

To answer the question of which criteria are *actually* used by Commodities Exchanges, a questionnaire (Appendix One) was sent to Commodities Exchanges. Approaching Exchanges themselves for answers, whilst it might appear logical, has certain difficulties. First, in many cases commodities form only a small proportion of the Exchange’s turnover. Second, a related point, no two Commodities Exchanges are the same (Gross, 2014:1). They differ enormously amongst themselves, both in respect of size, the commodities they trade, and the political and economic environments in which they operate. A response from a major Exchange might therefore not be appropriate for a smaller, purely Commodities Exchange. Third, the ownership of Commodities Exchanges is not uniform. It may be expected that privately or publicly owned Exchanges would be largely directed towards various forms of profitability and therefore choose their success criteria accordingly, whilst those Exchanges left under public or mutual ownership would choose different criteria. All the Exchanges that responded were in the private sector, however. Finally, there are simply not that many Exchanges that offer spot and derivative commodity contracts, no more than a few dozen all told. Exchanges continually open, close and merge. All these factors taken together mean that a purely statistical analysis of responses would be almost meaningless.

The most that can be hoped for is a judicious evaluation of the responses, which came from Exchanges worldwide¹, to arrive at a generalised conclusion.

PERFORMANCE MEASURE	RESPONSES
Turnover	<ol style="list-style-type: none"> 1. NOT USED 2. Total Volume of contracts traded 3. Number of contracts traded (two-sided) 4. Total Volume of contracts traded 5. Measured based on set targets of growth 6. Average daily traded volume in local currency 7. Absolute and percentage growth (annual) 8. Volume & Value Growth (annual and quarterly) 9. Value 10. Value
Open Interest Volume	<ol style="list-style-type: none"> 1. NOT USED 2. Total Open Interest 3. Total Open Interest 4. NOT USED 5. NOT USED 6. Total Open Interest (quarterly) 7. NOT USED 8. Volume & Value Growth (annual and quarterly) 9. Lots and units of the commodity 10. Total Open Interest (some contracts especially as billed thus)
Other public policy measurement	<ol style="list-style-type: none"> 1. NONE 2. Total Revenues. 3. NONE 4. NONE 5. NONE 6. NONE 7. NONE 8. NONE 9. NONE 10. As below
Introduction of New Contracts	<ol style="list-style-type: none"> 1. NOT USED 2. NOT USED 3. NOT USED 4. USED (Annual) 5. NOT USED 6. USED (Annual) 7. NOT USED 8. Both whether done and success (Annual) 9. NOT USED 10. USED
Net Operating Profit (NOP)	<ol style="list-style-type: none"> 1. Percentage growth, (Annual, IFRS, independently audited) 2. NOT USED 3. NOP (Annual) 4. NOT USED 5. Measured based on set targets of growth. 6. NOP (Annual) 7. NOP (Annual, Quarterly and Monthly) 8. NOP Absolute & Growth (Monthly) 9. NOP (Quarterly) 10. NOP (Monthly)
Return on Assets (ROA)	<ol style="list-style-type: none"> 1. Percentage growth, (Annual, IFRS, independently audited) 2. NOT USED 3. NOT USED 4. ROA (Annual) 5. Measured based on set targets of growth. 6. ROA (Annual) 7. NOT USED 8. Absolute & Growth (Quarterly) 9. NOT USED 10. ROA (Annual)
Net Profit (NP)	<ol style="list-style-type: none"> 1. Percentage growth, (Annual, IFRS, independently audited) 2. NOT USED 3. NOT USED

¹ Responses were received from Africa, Europe, the Near East, the Indian sub-continent and America.

	4. Net Profit (monthly) 5. NOT USED 6. NP (Annual) 7. NP (Annual, Quarterly and Monthly) 8. Absolute & Growth (Monthly) 9. NP (Quarterly) 10. NP (Monthly)
Return on Equity (hurdle rate/surpass IRR)	1. % growth, measured in IFRS terms and verified by independent audit firm 2. Used for analysis of return on discrete investments, not for the exchange in total 4. ROE (Annual) 5. Measured based on set targets of growth. 6. NOT USED 7. NOT USED 8. NOT USED 9. NOT USED 10. ROE (Annual)
Achievement of Budget	1. NOT USED 2. Budget vs. Actual variance analysis 3. NOT USED 4. Achievement of Budget (quarterly) 5. Measured based on set targets 6. NOT USED 7. NOT USED 8. Absolute, and percentage reduction (Monthly) 9. NOT USED 10. Monthly.
Other Measures - -	1. NONE 2. 'Product Profitability' - revenues generated versus resources consumed per resource consumption model 3. Market share as compared to the competing exchange 4. NONE 5. NONE 6. Income from subsidiaries 7. Collected exchange fees, number of registered members, additional revenue earned by exporters / amount saved by importers due to competition among buyers/sellers 8. New membership, New clients, Participation %, Distribution of volume, Net yield 9. NONE 10. NONE

From the empirical evidence, therefore, Exchange management have already made their decision: their Exchanges are run overwhelmingly as profit-making institutions using conventional financial criteria. At management level, Exchanges balanced the different criteria internally with their own performance management systems, which varied between Exchanges. Most Exchanges that responded used conventional financial criteria with just one using quantitative measures of performance other than total volume and open interest, and even their use was not universal. The picture that clearly emerges from the empirical evidence is of mature private sector institutions grappling with the same kinds of problems as other firms, such as how to balance between profitability and diversification, and responding by pursuing goals of profit measured in the same way that other firms do, with some variation in their use of individual measures which may be accounted for by geographic location or regulatory influence e.g. on new contracts. The evidence shows that parameters such as Return on Assets, Return on Equity, etc. are not necessarily used by an Exchange to measure its own performance (although analysts will use

them if publicly available to assess the Exchange's growth, valuation etc). The legacy criterion of turnover is well explained by the close correlation between Exchange turnover and profitability: Exchange fees are predominantly per contract.

The Exchanges were also specifically asked whether separate rules applied to their commodities contracts or divisions. The answers were uniformly negative. 'No special rules, revenues are ascribed as earned, costs ascribed based on resource consumption model, and profitability compared to other product categories' was one response.

Towards a Synthesis of Criteria

If either Government itself to take on responsibility for launching and funding Exchanges, as has happened in Africa from the creation of ECX in 2006 onward, or if Exchanges can clearly define and separate their socially responsible activities and enable investment in them whilst remaining profit-making institutions, a productive way forward for both public objectives and shareholder interests can be created. Evidently, Exchanges are subject to the objectives of multiple stakeholders. In this they are akin to state-run enterprises despite their mostly private sector status. In some cases this is reflected by actual government ownership, either majority or at least a minority stake; in other cases it is expressed by regulatory measures and by *sotto voce* instructions from the regulator, or even government itself. This is especially the case in respect of agricultural derivatives, where government may seek to encourage or even insist that an Exchange launch, promote or continue to maintain a market that in strictly financial terms is not commercially viable, i.e. that its launch, or continuation, generates a negative NPV for the Exchange and would have a negative effect on the financial criteria used by the Exchange. Government may offer subsidies in the short term, as in the case of Malawi, but the intention is to withdraw them eventually with the advent of higher trading volumes (Dentoni & Lies, 2015:25). This would not necessarily encourage the Exchange to invest in further agricultural derivatives contracts, however, as it omits the NPV calculation of the contract in its entirety i.e. including marginal launch costs, which Exchanges have indicated are usually around \$1m or somewhat more. Currently

however, there is no transparency, and very little available research, into the marginal cost of launching contracts – more transparency would assist government in its own decision-making process.

Conclusion

Commodities Exchanges have become important, even vital, ingredients in the developing of agricultural marketing systems worldwide. Although they are now for the most part profit-making institutions, and those that are not are being encouraged by government to demutualise, Commodities Exchanges continue to rely on quantitative measures of performance more appropriate to mutually owned or public sector institutions. They could instead draw on conventional finance literature to derive criteria for the success of both individual contracts, and themselves overall. Adopting these criteria in turn may result in refining pre-requisites for and obstacles to the success of Commodities Exchanges and the contracts they launch as well as influencing Government policy of support and SRI investment in Commodities Exchanges.

However, as they do so, the fundamental tension between government and private sector measures of success for Commodities Exchanges will become ever more apparent. What Government wants profit-making Exchanges to achieve, primarily in the soft commodity space, is small-scale, unprofitable, and would not generate positive NPVs and hence satisfactory returns for shareholders. If on the other hand shareholders' goals exclusively were to dictate Exchange policy - commodities in general but soft commodities in particular - would receive even less attention from Exchanges than they do now. Exchange management is therefore frequently caught in between two conflicting sets of measures of success, and ends up pursuing neither. The need is for government and donors to articulate their requirements more clearly, and back them up with not only regulatory clarity, but financial incentives such as subsidies which can be included in NPV analysis by Exchanges. If government and donors are serious about the success of commodities Exchanges, a financial bridge will need to be built so that profit-making Exchanges are not entirely deflected into financial contracts but instead have sufficient incentive to launch and maintain commodities contracts, in order to fulfil the social function that government calls on them to perform.

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