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A Revised Lesson for Accounting Measurement from Transaction Cost Economics

This paper disputes the view, put forward in an earlier issue of Australian Accounting Review, that transaction cost economics (TCE) shows that market values of assets are not appropriate in balance sheets and that the usefulness of balance sheets is therefore diminished. This view ignores the role of production costs, complexity and contracting costs in asset-ownership decisions, which reflect various incentives, including a trade-off between production costs and transaction governance costs. In fact, TCE theory lends some support to the provision of market values.

In an article in a previous issue of this journal (Mumford 2000), it is argued that transaction cost economics (TCE) provides a general lesson that negates both the appropriateness of market values in balance sheets and the usefulness of balance sheets *per se*. We challenge this misrepresentation of the TCE. Our disagreement focuses on three premises critical to Mumford's argument:

The primary purpose of the balance sheet is to predict future operating performance (in the current line of business).

- Nearly all assets on a balance sheet are highly specific and without identifiable market values.
- Market values do not provide information regarding future operations.

In rejecting Mumford's position, we argue that:

- the purpose of the balance sheet as asserted in the Australian conceptual framework (SAC 2) is manifold and includes measurement of adaptive capacity and solvency;
- TCE logic does not suggest that a firm's balance sheet will be dominated by "highly-specific" assets; and
- even where assets owned are specifically valued, the market value of such assets provides useful information to the users of general-purpose financial reports.

Mumford's criticism of the balance sheet goes beyond rejecting the usefulness of market values. He dismisses the decision-relevance of the balance sheet in favour of some form of improved income statement. He provides no comment on the need for information pertaining to financial position although he argues that the income statement can provide "reliable information about the financial affairs of the business" (p. 54).[1] Mumford does not provide supporting argument for his conceived role of the balance sheet. Because it is not critical to the issues regarding TCE and the balance sheet, we will leave it largely to the many others who may wish to debate this position. However, after examining the TCE issues, we briefly

consider the broader conceptualisation of the balance sheet presented in SAC 2 (AARF 1990) and Accounting Theory Monograph 10 *Measurement in Financial Accounting* (AARF 1998), against which Mumford addresses his argument.[2]

By using a naive model of TCE, Mumford concludes that "figures arising from market valuations are likely to be less reliable than generally asserted in conceptual frameworks" (p. 56). He argues that this is because of the effect of asset specificity on the composition of a firm's balance sheet. To this end, he examines the effect of TCE-based assumptions on the usefulness of market values in balance sheets. While the explicit consideration of transaction cost perspectives in financial accounting is probably long overdue, Mumford's conclusions are not supported by TCE. He oversimplifies the TCE perspective and ignores the role of production costs, complexity and contracting costs in asset-ownership decisions. We argue that asset-ownership decisions reflect various incentives, including a trade-off between production costs and transaction governance costs.

Consequently, the ramifications of TCE for market values in balance sheets are significantly less disheartening than Mumford suggests. Indeed, we indicate here how TCE theory lends some support to the provision of market values.

THE TCE EXPLANATION OF TRANSACTION GOVERNANCE MECHANISMS

The explanation of TCE we employ portrays the broader view suggested by Williamson and goes beyond that obtained by Mumford from Williamson (1985) and Reve (1990).[3] In TCE, three transaction attributes are emphasised: asset specificity, uncertainty and frequency. It is the degree to which these attributes are present for an asset and its associated transaction stream that can influence a firm's decision to acquire the asset directly or contract for the supply of the asset's output. Other factors, such as differences in production efficiencies, complexity and co-ordination costs, are also considered in this decision.

Before considering this larger picture, it is essential to establish a clearer understanding of the naive heuristic model of TCE implicitly employed by Mumford. We commence by defining the key transaction attributes of asset specificity and uncertainty before illustrating the TCE governance solution with a simple example.

Asset specificity describes how the value of an asset, to a particular owner, is dependent on an identifiable future transaction stream. The difference between an asset's value in its current use, and the asset's value in its next best use determines the *degree* of the asset specificity condition. Most non-monetary assets are specifically valued to some extent; therefore, it is the *degree* of specificity that varies across assets.

WE ARGUE THAT ASSET-OWNERSHIP DECISIONS REFLECT VARIOUS INCENTIVES, INCLUDING A TRADE-OFF BETWEEN PRODUCTION COSTS AND TRANSACTION GOVERNANCE COSTS.

Uncertainty relating to a transaction stream manifests itself in two forms: uncertainty regarding future states and uncertainty regarding the behaviour of self-interested individuals on whom the value of the transaction stream depends. TCE assumes that individuals have limited cognitive ability (the "bounded rationality" assumption) and that important economic information is often concentrated in a few individual agents and is costly to transfer (the "information impactedness" assumption). This means that contracts are necessarily incomplete because of the impracticality of writing a contract that adequately defines required performance in highly uncertain future states.

Importantly, it is the combination of uncertainty, bounded rationality and information impactedness that reduces the feasibility of writing effective contracts. As it becomes increasingly difficult (costly) to write effective contracts for the output of assets with a high degree of specificity, the firm has more incentive to internalise the asset.

Example

Consider a firm that requires a particular factor input – a "widget". Production of widgets requires significant investment in machinery that cannot be moved once installed and cannot be used to produce any other goods. The production technology is new and so there is considerable uncertainty relating to future conditions affecting production. Further, assume that the firm is the only potential buyer of widgets in the local area, and that transport costs make sales to distant customers unfeasible. The combination of the firm's geographic isolation and the

specialised production technology gives rise to an asset *specificity* condition – the productive assets have little value in alternative use once installed.[4]

What has TCE to say about the likely mode of acquisition of such factor inputs and, in consequence, the likely ownership of the assets required to facilitate production? The transaction stream associated with the machine for making widgets is subject to a contracting problem. If the widgets are to be procured by spot market purchases, another firm (a "specialist producer") must invest in the specific asset (the machine), produce the widgets and rely on short-term market contracting to determine a price for each sale. The specialist producer is exposed to the significant risk that prices can be negotiated downwards (below the supply price expected in a competitive market) once the investment in the specific assets has been made (and sunk).[5]

Klein, Crawford and Alchian (1995) demonstrate that, in these circumstances, a firm may be economically compelled to accept a price only marginally above the avoidable cost of production (per unit), as this price would still represent the best possible return to the owner of the asset. If this reduced long-run supply price is anticipated prior to the investment in the specific assets, and if short-term market contracting is the only contemplated form of transaction governance, the investment will not be made by a rational specialist producer.

How can factor inputs be procured in a manner that reduces the expectation of the specific asset investment being exploited? The downstream firm (the widget user) and the specialist producer can negotiate a long-term supply contract in which the future supply price is specified (eg, in dollar amount or as a cost-plus contract). Long-term contracting often provides sufficient protection from post-investment renegotiation of the gains from trade. This is likely to be the case where equitable future prices are relatively easy to calculate *ex-ante* and where contracted performance is relatively easy to specify, monitor and enforce.

For investments subject to high uncertainty and high information impactedness (that is, for transaction streams of high *complexity*), a long-term contract may not provide sufficient protection. Increased complexity conditions increase the difficulty of specifying future performance and reduces the possibility of efficient legal remedy for breaches. There remains the significant possibility that the purchaser will try to renegotiate the agreed supply price downward after the investment in specific assets has been made, notwithstanding that a contract is in place.

In TCE, such opportunistic behaviour is referred to as a *hold-up*. Mechanisms by which hold-ups are effected vary from blatant refusal to comply with contractual terms (remedy through the courts is expensive and imperfect) to deliberate, but difficult to punish, reductions in quality or timeliness of performance. The expectation of a hold-up during a transaction stream increases expected governance costs.

If the contracting arena does not provide the potential specialist producer with an acceptable level of protection against the threat of hold-up, it will not rationally invest in the widget-making machine. For the widget user to procure widgets In such circumstances, a prospective widget user may simply have to buy the specific asset and produce the widgets internally – a practice described as "internalisation". By bringing the productive assets and the sole source of demand for the asset's output under common ownership, the particular governance costs associated with a supply contract are avoided.

This simplistic view of governance mechanisms (market versus internalisation) is the basis for Mumford's contention that highly specific assets dominate firms' balance sheets. However, this is necessarily true only if the sole factor that varies across investment decisions is the degree of asset specificity. Production costs and transactional complexity also significantly affect the asset ownership decision and the resulting composition of a firm's balance sheet.

The effect of production costs

If we limit the world to this simple view of TCE, an investment problem conveniently reduces to one of minimising governance costs because production costs are treated as invariant. In TCE, production costs are defined in terms of economies of scale and scope forgone. As hierarchical governance systems (eg, long-term contracting, internalisation) increasingly supplant the spot market mechanism, the production costs (forgone economies of scale and scope) also increase. For any given hierarchical governance structure, production costs decrease as the specificity of a requisite asset increases. In the extreme situation (such as our widget example), where the firm's demand for a product is the market demand, production costs are equal under all governance structures. There are no economies of scale available that would give a specialist producer a cost advantage over an internal producer. This extreme case is rare. Typically, external specialist producers have multiple customers and so achieve a lower per-unit cost compared with the internal producer. This increases the cost of internalisation, while relying on market mechanisms increases governance costs. The firm's investment decision thus becomes the minimisation of production plus governance costs.

The relative influence of economies of scale and scope on total production costs varies markedly across products and their associated services. Consequently, a strict relationship between specificity and production costs cannot be inferred. Critically, in the case of transaction streams that require the support of assets of relatively low specificity but for which economies of scale and scope play little role in the cost of providing future benefits, internalisation of asset ownership by non-specialist producers may be preferred.

A simple example is that of motor vehicles. Many firms own motor vehicles, or lease them through on-balance-sheet finance leases, yet most motor vehicles have low specificity (they are readily deployable to other uses). Under the simple heuristic model adopted by Mumford, the low specificity of motor vehicles suggests that the firm would be better off hiring all of its motor vehicles on a day-to-day basis from specialist suppliers. However, the unit cost of providing the benefits attaching to a motor vehicle is not greatly affected by the number of vehicles owned.[6] The economies of scale forgone where a firm chooses to own a motor vehicle, as opposed to acquiring its services on a day-to-day basis, are small relative to other transaction streams. In this case, relatively low production costs under outright ownership may combine with lower governance costs to render outright ownership preferable.[7]

The effect of complexity and coordination costs

Transactional complexity describes the feasibility (or otherwise) of writing a relatively complete and enforceable contract to govern a set of transactions. The key variables affecting complexity are the level and nature of uncertainty affecting the production process and information impactedness, which describes the extent to which costly information relevant to production is asymmetrically distributed. Where investments involve production technology whose inputs and outputs are easily measurable and transferable, and where the contracting parties agree on performance measures, a sufficiently complete and enforceable form of contracting is feasible. With increasing uncertainty as to the production process and increasing asymmetry in the distribution of performance information, it becomes increasingly costly (and sometimes impossible) to write a contract that defines an acceptable measure of performance for an acceptable number of possible future states.

Negotiating and coordinating *ad hoc* agreements for high-frequency inputs are costly. Contracting and enforcement costs are transactional costs, not due to specificity, that may be avoided by internalising the transactions, thus inducing investment in low-specificity assets. Thus, investing in the relevant productive assets yields transactional economies in adaptability and dispute settling.

In the case of motor vehicle fleets, constantly recontracting for the rights to use vehicles implies a cost. Even where complexity is relatively low there are direct and indirect costs of entering into new short-term contracts governing the rights and responsibilities of the hirer of vehicles. If the firm needs the services of motor vehicles on a frequent basis, the costs of coordinating the allocation of this resource may be lower if the firm simply owns the vehicles outright or acquires a long-term lease on the vehicles. Intra-firm coordination is less costly if the internal "authority relation" allows for efficient adaptation to unexpected circumstances which could not be specified explicitly in a contract. For example, if the usage of a particular motor vehicle needs to be increased, this can be implemented without the need to renegotiate the supply contract.

In the simple heuristic model, complexity increases only governance costs. Higher transactional complexity makes an external contractual solution relatively more expensive and thus provides an incentive for internalisation. Importantly, there is no necessary causal connection between asset specificity and complexity – either can exist in the absence of the other.[8] A firm may choose to internalise transactions supported by assets of relatively low specificity, if transactional complexity is sufficiently high.

Non-specific assets on the balance sheet

It does not follow that, merely because asset specificity and bounded rationality can provide an incentive for a firm to internalise an asset, all acquired assets necessarily have a high degree of specificity. Nor does it follow that, merely because a firm's value-in-use of a particular asset is subject to specificity, that there is no market for that asset sufficient to identify a price. Mumford, however, asserts the *non sequitur*: "Any asset which has a clear-cut market price will probably not appear on the balance sheet because it will be purchased day-to-day, in small amounts as and when required" (p. 53).

We have explained above how production costs, complexity and coordination costs may induce a firm to internalise low-specificity assets. The most rudimentary examination of the accounts of most companies also belies Mumford's assertion. Most motor vehicle fleets, real estate holdings and stockpiled inputs are easily understood contradictions of Mumford's claim.[9] There may (or may not) be significant degrees of specificity attaching to such assets but they are on many firms' balance sheets. Thus assets may be held, in the absence of asset specificity, merely because of an aggregate cost advantage.

SPECIFICITY AND THE RELEVANCE AND RELIABILITY OF MARKET VALUES

We have argued why low-specificity assets may appear on the balance sheet. We do not assert that specifically valued assets will not appear on a firm's balance sheet. Almost all assets are specific to some degree. *Some* of the assets owned by a firm *will* be highly specifically valued. Mumford asserts that such assets have no identifiable market price.

Asset specificity essentially indicates that the value of the asset to the firm (in its current use) is greater than the value obtainable from the next-best use of the asset. Where the next-best use is external, the realisable market value of the asset will be less than the value-in-use to the firm. This does not mean that there is no identifiable market price.

The lower the degree of market completeness (for demand) for the asset, the more difficult it becomes to ascertain a price *ex ante*. Higher specificity *may* be associated with incomplete markets but this is not a necessary consequence. A firm may have a technological or knowledge advantage that allows it to extract greater value from an asset than other potential owners. This does not preclude the other intended rational potential owners from exhibiting demand for the asset – it merely implies they will be willing to pay a price that is correspondingly less than the value-in-use attributed by the advantaged firm.

The difference between a particular asset's value-in-use to a firm and the realisable market value will, under particular circumstances, indicate the appropriable quasi-rents attributable to that assets.[10]

In the case of some high-specificity assets, the difference between market value and value-in-use may not be as great as Mumford asserts. Many assets, *considered individually*, are highly-specifically valued because they are best employed when co-located with related assets. Even when production processes are technologically separable, there are well known production cost advantages to minimising inventories of intermediate products. In many cases, financial accounting recognises such specific assets separately. However, when considering the market value of such assets, Monograph 10 (para 2.79, p. 48) is explicit in stating that a market price should be obtained for a group of related assets (which Monograph 10 terms a "composite asset").[11] An asset considered individually may be highly specifically valued. If it is sold with its companion assets, however, a market value much closer to value-in-use is expected.

IMPORTANT CONSEQUENCES OF ASSET SPECIFICITY CENTRE ON THE RELATED ISSUES OF ADAPTABILITY AND ACCESS TO AND COST OF CAPITAL.

IMPLICATIONS OF TCE FOR THE BALANCE SHEET DISCLOSURES

TCE has much to contribute to understanding choices of governance and firm boundaries. It provides a rich framework for analysing incentives to (not) internalise transaction streams by (not) acquiring assets. TCE, along with agency theory and the property rights literature, can aid in our understanding of complex contracting arenas. These fruitful areas of analysis do not provide any basis for precluding market values as an appropriate accounting measurement for assets. They help us understand the information needs of financial statement users and, in doing so, suggest market values may be the most appropriate means of reflecting specificity costs.

The forecasting problems for identifying value-in-use are well known and individuals' estimations may vary considerably, depending on their private information sets and assumptions regarding future economic states. As suggested by Mumford, improved historical performance disclosures may improve the shared information sets and lead to greater convergence in individuals' valuations of the firm. Accepting this position, knowledge of the realisable market values of a firm's assets will provide part of the measure of the firm's susceptibility to subsequent hold-up problems and how consequential future performance may vary from that signalled by the historical data. Additional information needed to evaluate susceptibility to hold-up focus mainly on the nature of the market demand for a firm's outputs and the nature and value of alternate uses (including disposal) a firm has for its stock of assets.

Important consequences of asset specificity centre on the related issues of adaptability and access to and cost of capital (Shailer 1999). The availability and cost of capital reflect both a firm's probability of failure or default (see Akerlof 1970, Ross 1977) and the realisable value of available collateral (see Barro 1976, Benjamin 1978, Chan and Kanatas 1985). Reduced adaptability, due to a high proportion of assets having a high degree of specificity, means that the survival of such firms is particularly dependent on identifiable classes or sets of transactions. SAC 2 explicitly identifies the firm's ability to "modify the composition of the resources under its control" (para. 35) in the face of changing economic circumstances as being relevant to the needs of financial statement users. The current cash-equivalent of a firm's assets, however different in magnitude from the assets' value-in-use, provides useful information in this respect.[12]

From the auctions literature, Milgrom and Webber (1982a, 1982b) and Matthews (1984), in a TCE analysis, indicate that sellers bear the cost of buyer mea-

surement, consistent with the outcomes of Akerlof's lemon's pricing analysis. On this basis, the absence of information regarding adaptive prices and appropriable rents will induce under-pricing of the firm's equities.

While our analysis is also incomplete, it demonstrates (1) that TCE does not suggest that the only assets owned by firms will be highly specific; and (2) how TCE, rather than negating the usefulness of market values, provides some support for the disclosure of market values.

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NOTES

1 There appears to be an implied preference for historic cost measures in some of Mumford's commentary (eg, his citation of Ijiri at p. 54) but he does not explicitly state such a preference. His purpose and meaning in subsequent comments, regarding the role of asset valuations in the income statement, are difficult to identify.

2 We also ignore the discussion of the UK's financial reporting standard, given that Mumford acknowledges it has little relevance to the Australian monograph.

3 If the very restrictive assumptions of Williamson's simplistic heuristic model were to hold, the conclusion that assets are held solely as a function of specificity would be supported. However, as recognised by Williamson (1988, pp. 90-1), the heuristic model is far from realistic.

4 Asset specificity may be caused by several factors. For a discussion of these factors, see Williamson (1985)

5 The costs associated with such post-contractual haggling and re-adjustment of prices are described by Williamson as "governance costs". When considering a potential investment, expected governance costs are a relevant consideration in the project evaluation process.

6 The relatively low economies of scale for a motor vehicle fleet can be contrasted with the economies of scale that attach to electricity production. The economies of scale that would be forgone by internally producing electricity are so large that the contracting costs and threat of hold-up (subsequent price increases) – even from a monopolistic utility company – are insufficient incentives for internalisation.

7 We do not suggest that the service potential of less specific assets are infrequently acquired by means other than outright ownership.

8 See Milgrom and Roberts (1990) for a formal proof of the incentive for internalisation in the absence of specificity.

9 Mumford appears to consider inventories, as current assets, to be outside his analysis. Other TCE proponents also recognise non-specificity incentives for internalising transactions. For example, Williamson (1975, p. 51) alludes to the need for buffer inventories when outsourcing individual production steps to the market. Internalising production may obviate the need for buffer stocks of intermediate products.

10 In addition to the classic TCE conditions pertaining to specificity and opportunism, we need to either ignore asset synergies or view the complete set of assets held for a particular production activity as a single asset. The appropriability of rents depends on the market structure, particularly the number and bargaining strength of buyers for the firm's outputs, and alternative uses available to the asset-holding firm.

11 An example is the going-concern value of a petrol station versus the aggregated individual values of its component assets.

12 For example, if we consider the case of two otherwise identical firms, which differ in respect to the re-deployability of their non-current assets, disclosure of market values assists users of financial statements to assess the varying risks of investment in these firms.

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