

Foreign Currency: Accounting, Communication and Management of Risk

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Abstract

We obtain survey responses from 168 North American CFOs and interview 16 of them to understand (i) how foreign currency exposure is measured and reported inside and outside the firm; (ii) how goal setting, performance evaluation and compensation of managers reflect exchange rate impacts, (iii) what specific currency exposures firms hedge and why? To develop expected answers to these questions, we provide a series of exhibits of hypothetical transactions at, and financial reports for, the foreign subsidiary. We benchmark these theoretical insights against the survey responses and uncover several questionable managerial choices. First, although no performance measure is insulated from a currency impact, a large majority of senior managers and board members only review translated USD data, especially cash flows, that are fraught with significant measurement error. Second, companies are more likely to communicate, both inside and outside, the currency impact on net income and revenue but not on operating costs, operating cash flows and the foreign subsidiary's balance sheet. Hence, decision makers, especially investors, will be unable to readily isolate the portion of the firm's performance attributable to currency changes. Third, many of the current practices used to (i) set budgeted exchange rates for planning; (ii) hold local managers accountable for currency fluctuations; and (iii) manage foreign currency risk are inconsistent both with one another and with theory. We hope our work furthers the understanding of currency exposure among students, academics and practitioners.

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Foreign Currency: Accounting, Communication and Management of Risks

1.0 Introduction

“I think very few people in the corporate side really understand the effects of FX, and virtually no investors.” Interviewed CFO of a large multinational on 2/28/2017

Since the fixed exchange rate regime ended, the impact of fluctuating foreign exchange rates has plagued internal and external users of accounting information. The FASB has struggled with the topic and has issued four accounting standards including the very first one, SFAS 1, followed by SFAS 8 which was revised again with (i) SFAS 52 that dealt with the balance sheet and income statement; and (ii) SFAS 95 that covered the statement of cash flows. Analogously, managers have grappled with how to budget for, evaluate and reward performance when traditional performance measures of subsidiaries and the group are significantly impacted by changing exchange rates. Given managers’ difficulties with exchange rate issues, it is unrealistic to assume analysts and investors can parse out the impact and understand its implications on performance and valuation. As the opening quote illustrates, exchange rate volatility impacts real and reported measures of a firm’s business in ways that are complicated and arguably little understood or appreciated by board members, senior executives, analysts, investors and empirical researchers. In this paper, we hope to further our collective understanding of the measurement and management of foreign currency exposure.

Unsurprisingly, given the requirement for consolidated group reporting in firms with multinational operations, managers, investors, analysts and empirical researchers utilize aggregate measures in a single reporting currency. Foreign exchange rates impact both (i) specific transactions in a currency other than an entity’s operating (functional) currency; and (ii) translation of a subsidiary’s measures in its operating currency to its parent’s reporting currency. The translation process is analogous to restating length from centimeters to inches. However, unlike the ratio of length metrics that is constant at 2.5 centimeters to an inch, floating exchange rates are volatile.¹ Such volatility introduces differences in that translation process which potentially impacts every measure in an accounting system and report. As we demonstrate in a series of exhibits, no decision relevant measure is immune from this impact and given exchange rate volatility in the last few years, these impacts can be material. These measurement issues significantly affect management decisions yet, as our survey evidence indicates, there is little consensus in actual practice.

¹ In the last few years the financial press has frequently reported on the impact of foreign exchange on companies’ performance. For example, “Morning Ledger: Mighty Greenback Pummels U.S. Tech Earnings” *The Wall Street Journal* February 1, 2016.

To assess how current practice deals with exchange rate volatility, we conducted a detailed field study, consisting of 168 survey responses and 16 interviews with Chief Financial Officers, Treasurers and Controllers (collectively labeled CFOs), to provide systematic answers to four sets of questions related to: (i) reporting; (ii) communication; (iii) budgeting and performance evaluation; and (iv) risk management. To develop expected answers to these questions, we construct a series of exhibits containing hypothetical foreign currency transactions at, and financial reports for, the subsidiary. Benchmarked to the theoretical concepts illustrated in the exhibits, we document several novel findings summarized after the research questions presented under the four mentioned captions.²

(i) Reporting: How do managers' report and consume data on cash flow which includes a currency component? We question the common perception that cash flow is a key measure of performance that avoids accounting issues. Given how cash flows are measured and reported, we ask which exchange rates are employed to translate the components of cash flow and how these rates match with the rate used for various balance sheet and income components. How do differences in exchange rates used impact various measures employed in performance evaluation and compensation contracts (e.g., profitability measures, revenues, cash flow and earnings targets/forecasts)?

We find that the actual foreign currency rates used in the income statement, balance sheet and the cash flow statement are usually not internally consistent. The proportion of CFOs who either plead ignorance or explicitly report the use of internally inconsistent exchange rates are (i) 56% for depreciation add backs in the indirect cash flow statement; (ii) 80% for working capital changes; (iii) 73% for debt issuance/repayment; and (iv) 76% for capital issuance and buybacks. These findings are problematic especially because survey respondents say that 78% (86%) of senior managers (board members) only review translated USD cash flows from their foreign subsidiaries. On top of that, via a specific hypothetical question in the survey, we show that the cash flow measure that senior managers and investors have access to and use is not a real cash flow measure in an economic sense. If managers do not have the information to identify the underlying economic cash flows, then it is implausible for analysts and investors to assess or forecast real cash flows either. Apart from imposing significant barriers in understanding the business, this finding also suggests that investors cannot hedge the firm's foreign currency exposure on their own, contrary to what textbooks claim. These results may seem somewhat surprising because (i) managers have detailed data and could, in principle, measure and report the

² The literature contains two related field studies that have focused primarily on risk management. Brown (2001) investigates the foreign exchange risk management program of HDG Inc. (pseudonym), a US-based manufacturer of durable equipment, and finds that informational asymmetries, facilitation of internal contracting, and competitive pricing concerns appear to motivate why the firm hedges. Bodnar, Giambona, Graham and Harvey (2016) conduct a survey of CFOs to understand why firms manage risk. They find that that the manager's personal risk aversion in combination with other executive traits plays a key role in hedging.

underlying transactions to reflect the impact of exchange rates; and (ii) the advancement of technology and management information systems could, in theory, have enhanced management's ability to isolate exchange rate impact in ways that were infeasible when the original U.S. accounting standards were written.

(ii) Communication: How is information about foreign currency exposure communicated inside and outside the firm? Does this choice differ internally for the board of directors, senior management and local managers? When presenting results, is the currency translation effect isolated for the board or the senior management? Do they factor it into their decisions? What information about foreign currency exposure is presented to analysts and investors?

64% (59%) of surveyed firms state that they communicate the foreign currency impact on revenue (income) to investors and analysts. However, companies rarely communicate the foreign currency impact on operating cash flows (25% say they do), operating costs (38% say they do), liabilities (13% say they do) and assets (13% say they do). Further, reviewing the financial statements of interviewed companies and others where the company is identified, shows that when the foreign currency effect is isolated, in most cases, it is quite aggregate and does not allow for meaningful by currency historical or forward-looking analysis. Hence, analysts and investors must struggle to understand how much of the firm's earnings are affected by potentially unsustainable foreign currency changes.

(iii) Budgets and performance evaluation: How do managers set exchange rates to be incorporated into targets and budgets? How are exchange rate impacts incorporated (or excluded) in measurement and performance evaluation of subsidiaries and management? Are local managers and corporate executives held similarly responsible for the impact of currency fluctuations in their performance evaluations? If so, which aspects are they responsible for? Are the exchange rate impacts factored into compensation decisions based on performance metrics for senior and local managers?

We document several issues with how exchange rates are incorporated in budget planning and performance evaluations. First, many seem to rely on frozen or constant currency rates that are usually communicated to the subsidiaries at the beginning of the budgeting period. Less than 10% of CFOs state that they use local managers' inputs in setting such a budgeted exchange rate. In sharp contrast, between 45-49% of surveyed firms make local managers responsible for the foreign currency impact on local earnings translated back to USD. Such a mismatch in incentives is bound to distort economic decisions related to product pricing and capital allocation to the subsidiary. Moreover, most of the firms appear to use a single rate for the full forecast period ignoring use of market-based forward curves even for major currencies.

Second, for around half of surveyed firms, neither the local nor corporate officers are held responsible for transaction and translation gains and losses in their performance evaluation process.

Hence, apart from the shareholders, no one in management is apparently held accountable for these gains or losses³. Third, only about half of our surveyed public firms' factor in translation gains and losses reported in Other Comprehensive Income (OCI). In contrast, only 31% of private firms ignore such gains and losses in their evaluation of senior managers. These gains and losses result from a financing decision of leaving the net investment in the subsidiary exposed to the local currency. We believe such translation adjustments represent a real financing cost. Local managers should be responsible for the expected (hedgeable) portion of this and corporate executives should be responsible for the remaining "unexpected" portion.

(iv) Risk management: What specific exposures do firms hedge? Why? Do firms hedge to their reporting currency or to their functional currency or both? We document several new frictions in how firms hedge and report foreign currency exposures. First, the actual cash flow exposure for shareholders will arise when the subsidiary repays capital via dividends or repurchases of stock, at which point any cumulative translation adjustment (CTA) will be moved to earnings. Hence, it makes more economic sense to hedge dividend payments than CTA. Yet, only 36% of CFOs say they hedge dividends from the subsidiary. However, 31% of all respondents say they hedge the net investment (CTA) despite a plausible argument that such hedging is a waste of resources by creating cash exposures on expiration of the hedges.

Second, when asked whether they would hedge a non-functional currency exposure (say sterling) to the functional currency (say the Euro) or the reporting currency (say USD), only 42% of CFOs say they would hedge the sterling exposure to the Euro, which represents the cash flow exposure of the transaction. 29% of CFOs say they would hedge to the reporting currency USD, despite the absence of a direct economic or cash flow impact associated with such a hedge. Third, along similar lines, 40% of CFOs of public firms would purchase a derivative to preserve and report a 5% growth in earnings driven purely by exchange fluctuations with no organic growth. Several interviews confirmed that hedging activities are often motivated to smooth out the impact of currency volatility on reported operating or net income.

Fourth, 45% of surveyed executives from public firms believe that accounting standards constrain their ability to manage risk. In the interviews, we find that (i) CFOs claim that SFAS 133 makes them take more risk; (ii) firms appear to over and under hedge their exposures at times; (iii) hedge effectiveness is often derived ex post after the derivative is bought, contrary to the spirit of SFAS 133; and (iv) the three areas, treasury, tax and controller, often do not work in concert to optimally manage currency risk.

Our work is important to academe and practice for several reasons. First, the exhibits we develop to illustrate the conceptual foundation and the problems associated with foreign currency measurement

³ Several interviewees intimated that managers are happy to take credit for gains from foreign exchange related items but try to minimize any attribution for losses.

and management are likely to be useful in learning about these issues both for students and practitioners. Second, we show that serious inconsistencies plague the application of foreign currency rates to each line item on financial statements. Such inconsistencies make it hard for most insiders and outsiders to (i) separate the firm's economic operations in local currency from the impact of translation to the reporting currency (e.g., dollars); (ii) hold management accountable for the return on capital employed in foreign subsidiaries; and (iii) sensibly forecast sustainable income and cash flows for multi-national companies.⁴ Despite the common rhetoric, in practice and finance textbooks, that cash measures are immune from accounting issues, we show that cash and cash flow are also severely impacted by the currency translation process. Hence, most valuations that rely on cash flow data of companies with international operations will contain material measurement error.

Third, foreign currency adjustments impact virtually every area of accounting research.⁵ We wonder whether the results of many studies in the accounting and finance literature covering multinationals would differ if there was a clearer partitioning of accounting measures based on foreign currency aspects of the business including any potential hedges. In particular, quantitative investment strategies, whose popularity in practice has exploded in recent times, are partially built off academic work that tends to under-emphasize the foreign currency measurement issue. It is easy to appreciate how these investment decisions and potentially market prices will deviate, at least for some time, from the underlying fundamental reality because of the misperception of what the reported measures represent.

Finally, several papers in the literature that evaluate the value-relevance of foreign currency translation adjustments (e.g., Collins and Salatka 1993, Soo and Soo 1994, Bartov 1997, Bodnar and Weintrop 1997, Dhaliwal et al. 1999, Wong 2000, Louis 2003) take such adjustments as given. Indeed, other papers suggest that the stock market misprices the foreign currency exposure of a firm (e.g., Bodnar and Bartov 1994). We open the black box behind (i) how the translation adjustment number is actually compiled; and (ii) how currency exposure affects capital budgeting, hedging and performance evaluation decisions?

The rest of the paper proceeds as follows. Section 2 describes how we gather the data via a survey with 168 CFO respondents and 16 direct interviews. Section 3 develops the exhibits used to illustrate the difficulties associated with foreign currency measurement, reporting and management.

⁴ Modeling work by Beaver and Wolfson's (1982 and 1984) recognized the potential for such misinformation under the assumption of perfect and complete markets.

⁵ Examples include budgeting, capital allocation, internal and external measurement of performance, compensation incentives, consolidation practices, fair value adjustments, the distinction between cash and accruals, the notion of sustainable and/or persistent earnings, and the ability to forecast future earnings and cash flows of a firm.

Sections 4-7 outline the results linked to the survey questions and insights from interviews. A few concluding remarks are offered in the final section.

2.0 Interview and Survey Samples

Based on our experience and preliminary interviews with CFOs, we created a series of survey questions intended to understand executives' views on foreign currency exposure and how they managed, evaluated and communicated the impact of foreign exchange on their actual and reported performance. To encourage frank discussion, we promised the executives anonymity. The first interview was conducted on November 15, 2015 and the final interview concluded on March 13, 2017. Interviews are time consuming and involve identifying potential interview subjects, conducting background research about the company's foreign currency practices from the firm's 10-K and proxy statements, interview time, transcribing, and coding of the responses. However, given the complexity of the issues and the lack of detailed public data on most of the issues we investigate, they are an ideal way to understand our topic. Early interviews were more open ended and were used to hone the survey. Later interviews were used to follow up on specific answers in the surveys filled out by these executives. Un-tabulated results reveal that the companies in the interview sample are larger than the average COMPUSTAT firm.

2.1 Survey logistics

We obtained valuable feedback on the initial draft of the survey instrument from (i) four individuals, comprising academics, a treasury controller and a consultant in hedging and foreign currency accounting; and (ii) one professional expert on survey content, wording, and scientific design. Our goal is to minimize biases induced by the questionnaire and to maximize the response rate. We used the penultimate version of the survey to conduct 10 beta tests to gather feedback and to make sure that the time required to complete the survey is reasonable (about 15 minutes). Based on this feedback, we made changes to the wording of several questions, and deleted some questions. The final survey document contains 16 main questions, some with sub-parts, and was administered over the Internet (<http://CBS-FEI-FX.VIEWONLY.sgizmo.com/s3/>). The survey is anonymous and does not require subjects to disclose their names or their corporate affiliation and is IRB approved at the authors' home institution.

Invitations to take the survey were sent via email by the Financial Executives Institute (FEI) to their members. It is important to note that we do not have access to FEI's mailing list. To generate the master list of public firms that should be surveyed, we gave FEI a list of 1,031 public firms identified from COMPUSTAT as those that report non-zero foreign assets, foreign income or cumulative translation adjustments in fiscal 2015. FEI mailed executives at 915 of these public companies and also emailed executives at 738 private companies. Because of the absence of publicly available financial data, we could not narrow down the list of private firms to only those that report currency exposure. Most of the

executives surveyed have the job title of CFO (including job titles such as Treasurer, VP or Senior VP of Finance, and Chief Accounting Officer, and Controller).

The survey requests were sent out on October 31, 2016. Reminders were sent twice the last being on January 24, 2017. The survey closed on April 10, 2017. We received 207 responses (Table 1, panel A). That translates to an overall response rate of 12.5% (207/1,653 firms).⁶ By construction, this response rate is biased downwards because we could not ex-ante identify private firms with currency exposures. Of the 207 responses we received, 39 were disqualified from filling out the survey because these (presumably private) firms did not have foreign assets or foreign income. Even after they qualify, participants are allowed to skip questions if they did not want to answer them. That is why the number of observations for several questions in the survey falls below 168 (207-39). Most questions were followed by a free-text response option, so that survey takers could provide answers that were not explicitly specified in the question. We comment on these qualitative textual responses at appropriate places in the paper. After considering survey takers that did not identify themselves as public or private (Table 1, panel B), the response rate for public (private) firms ranges from 10% to 12.6% (7% to 10.3%).⁷

While we believe that surveys and interviews are an excellent way to obtain data that provide insights about currency exposure, we acknowledge that there are limitations. Studies such as ours suffer from problems such as potential response bias, limited number of observations, whether questions on a survey could be misinterpreted, do respondents do what they say, do they tell the truth, do they recall the most vivid or their most representative experience. Finally, it is not possible to make statements about causality, given the single draw from the population at one point in time. Nonetheless, we hope that our combination of interviews and survey evidence provides fresh insights into the issues we study perhaps uncovering areas that are otherwise underdeveloped in research based on more traditional methods. We encourage researchers to supplement our work with archival research on currency related reporting and incentive issues.

2.2 Summary statistics and data issues

⁶ The response rate is higher than internet based surveys of senior executives conducted in recent times. Graham and Harvey (2001) report a rate of 9%; Graham, Harvey and Rajgopal (2005) obtain 8.4% in the most directly comparable Internet-delivered portion of their survey; and Dichev, Graham, Harvey and Rajgopal (2013) report a rate of 5.4%. The quarterly CFO survey administered at Duke University attracts a response rate of approximately 4.5%.

⁷ Of the total 207 responses we received, 39 respondents were disqualified because they did not pass the first filter question which asks whether they have foreign assets or income. Because we had screened out public firms without foreign currency exposure, the disqualified responses are likely to be private firms. 92 (54) responses identified themselves as public (private) firms. 22 responses did not identify themselves as either public or private. Hence, the response rate for public firms is 10% (92/915) and for private firms is 7.3% (54/738). If the 23 unidentified responses come from public firms, the response rate for public firms is 12.6% (115/915) and if they came from private firms the rate for private firms is 10.3% (76/738).

While the survey is anonymous, we gather demographic information to understand our sample better and to explore conditional effects in later analyses. In particular, the survey instrument asks for total revenue generated from foreign subsidiaries in the last three years, the company's size (sales revenue, number of employees), industry, measures of profitability (after-tax profit or not, the firm's ROE over the last three years, growth opportunities (annual growth rate in sales revenue), valuation (price-earnings ratio), information environment (public and the exchange they are listed on such as NYSE, NASDAQ and AMEX versus private), leverage (debt to total assets) and the company's age.

Table 1, panels A-F, reports descriptive data on the surveyed firms. Table 1, panel A summarizes the overall make up and response rate of the survey. Table 1, panel B shows that at least 63% of our sample comes from public firms. Following the recommendation by List (2007), we benchmark our public firm survey sample to COMPUSTAT. Table 1, panel F shows that survey respondents that are public (and hence we can obtain data for) are (i) larger (36% of surveyed firms report revenue in excess of \$5 billion relative to 12% of COMPUSTAT), more levered, and more profitable relative to COMPUSTAT.

3.0 Reporting concerns

In this section, we highlight how translation of currency exposures creates a number of reporting and measurement issues in practice.

3.1 The impact of foreign currency on cash flow measurement

In academe (especially in finance departments) and in practice, the mantra that “cash is king” is often heard. This maxim is based on the presumption that cash is available to service obligations, and invest or return capital to shareholders. The “free cash flow” concept is the foundation of a discounted cash flow (DCF) which is the basis for the most commonly used multi-period valuation model. The question we pose is whether reported cash flow (or even the reported cash balance) measures for multinational companies are available for actual use? Many academics and practitioners assume that cash balances and cash flow are free of any accounting measurement issues. As we demonstrate in Exhibit 1, for consolidated measures of multinationals, this assumption is incorrect. With any resources, obligations, transactions and activities measured in a non-reporting currency, the reported measures under current practice in any reported currency do not reflect cash flow that is available for use (e.g. distribution).

Consider the common case of a U.S.-based group which owns a European subsidiary. Assume that the local currency (Euros) is used as the functional currency for reporting purposes.⁸ Fluctuating Euro-USD exchange rates over the quarter ended March 31, 2016 will mean that the current period's

⁸ The notion of a functional currency (FC) is discussed in greater detail in section 3.71.

balance sheet and income statement are translated back to USD at different rates. Moreover, the current and prior period's balance sheets and income statements will also reflect different exchange rates. Such variation in rates automatically causes a translation impact in reported USD cash flows. The only way to avoid this is if all the cash flows of the subsidiary are measured in local currency and translated at one rate.⁹

We illustrate this basic problem in Exhibit 1. We show quarterly transactions using a worksheet approach that allows readers to see how the transactions affect the various accounts and balances. For simplicity, we impose articulation which means that if a translation rate is used in the income measure it will also be used in the related balance sheet account (e.g. cash). Panel A reports the amounts in Euros which is the operating currency of the subsidiary. As shown, the actual cash flows (the transactions reflected in the column titled "cash") sum to an outflow of €1,800. The number, €1,800, by definition, also equals the change in the Euro cash balance of the firm over the quarter ended March 31, 2016. The subsidiary's earnings are €15,000 for the quarter. The annual depreciation and amortization expenses reflect useful lives of 10 years for PP&E and intangibles, each of which are assumed to be two years old at the beginning of 2016. Free cash flow for the European subsidiary is €13,600. In this example, we assume the subsidiary operates entirely in Euros and the only USD flow is the dividend paid at the end of the quarter to the U.S. based headquarters of the group.

Panels B and C of Exhibit 1 present two examples of translated amounts using exchange rate methodologies that we have seen in practice. Panel B uses average exchange rates for income and related cash flow items, including any receipts for receivables and payments for payables. However, given current accounting regulations and the majority of survey responses we received (documented in section 3.3), debt issuance, capital expenditure and dividends are translated at the dates when they occur.¹⁰ This measurement criterion is similar to the accounting rules for the income statement and could be applied to other items such as changes in receivables and payables too if they occurred evenly over the period. In

⁹ The issue is exacerbated with USD as functional currency as the remeasured and reported USD cash flows are not actually realized USD cash flows.

¹⁰ The survey responses are consistent with page 9 of SFAS 95 (para 25) which states, "A statement of cash flows of an enterprise with foreign currency transactions or foreign operations shall report the reporting currency equivalent of foreign currency cash flows using the exchange rates in effect at the time of the cash flows. An appropriately weighted average exchange rate for the period may be used for translation if the result is substantially the same as if the rates at the dates of the cash flows were used." Note that a strict reading of SFAS 52 also says that all revenue and expenses would be translated at the rates when they occur but that as this is impractical they can use a weighted average. The weighting is supposed to be such that monthly and quarterly weighted averages are internally consistent. Actual practice varies in that some firms resemble panel B whereas others resemble panel C of Exhibit 1.

Panel C, we use time specific rates for the payments and receipts to illustrate the impact of using more specific rates.¹¹ A few basic observations follow:

Observation 1: Distorted cash flows using average exchange rates

We begin by recognizing the difference between the change in translated USD cash balances and the Euro change in cash balances translated at the average (or period-end) rate. In Panel B, when we use the average rate to translate the Euro cash outflow ($\$1,985 = \text{Euro } 1,800 * 1.086$) and compare this to the decline in translated USD cash balances at the end relative to the beginning ($\$1,760 = \$4,755 - \$ 6,515$), we find that the former is \$225 higher. This distortion is more than 10% of either the Euro or USD cash flow numbers and hence material. Had we used the USD translated cash flows (based on average rate for all operating cash flow items) instead, we would obtain a translated USD cash flow of \$2,517 (sum of changes in cash over the quarter). If one were to compare \$2,517 to \$1,760, the difference grows to \$(857) and is around half of the change in translated USD cash balances. Note that the current example represents a simplified quarterly analysis because the transactions and exchange rate patterns differ over quarters. The potential for distortions in the underlying patterns grows if we were to consider year to date or annual data. We emphasize again that all these differences are caused purely by measurement conventions and are not “real” in any economic sense. To make matters worse, external users (and most internal users) have no easy way to know whether the firm has used the measurement conventions in panel B or C of Exhibit 1.

Observation 2: Distorted cash flows using SFAS 95 rules

In Panel C, consistent with the original regulations related to the cash flow statements (SFAS 95), we use the specific rates for the cash receipts and payments. We obtain a reported cash outflow of \$(3,231) representing the sum of changes in cash over the quarter reflecting a worse cash flow difference of \$(1,471) or more than 80% of the change in translated cash flow balances.

Observation 3: Distorted FCF calculations

Many managers and investors use Free Cash Flow (FCF) for decision making, especially for valuations. There are several issues involved in calculating FCF in USD. Typically, when calculating FCF, we start with EBIT (earnings before interest and tax), add back depreciation and amortization (DA), deduct capital expenditure and adjust for net change in working capital. When calculating FCF in USD, the question arises as to which set of underlying data to use. In panel A of Exhibit 1, we report the calculation in Euros. If we had this data, we could use a single rate in USD to translate those cash flows.

¹¹ In the illustrations provided in SFAS 95 (now ASC 830-230-55) the FASB demonstrates a mix of date specific and average rates for translation of non-USD revenue and cost of goods for subsidiaries.

If we use the average rate as used in the income statement and calculations of EBITDA, panel B of Exhibit 1 suggests that we would arrive at a FCF number of \$14,994 (Euros 13,600 * 1.103).

If we were to use such a FCF number in a valuation or a forecast, we would have to consider (i) whether the underlying Euro FCF measures are persistent; and (ii) what the exchange rate impact of Euro FCF translated into USD might be (given the free cash flow is not actually realized in USD). Usually practitioners use a period-end spot (or forward rate) in such a projection. Such a calculation would yield a USD FCF of \$15,397 (Euro 13,600 * 1.132), a number that is almost 3% higher than \$14,994 discussed earlier (Panel A). If this impact were to occur in a terminal value in a valuation, the compounded impact can be high. For instance, the terminal value would be inflated by 38% (30%) if one were to assume a cost of capital of 8% (10%)!

In practice, the underlying Euro FCF is not generally available to external users. Hence, the simple examples understate the complications, as the USD FCF calculation is usually based on already translated measures. If we use the USD measures based on exchange rates typically used in cash flow statements (Panel B), where the capital expenditure is time specific and changes in working capital are based on the change in USD balances, then we see that the USD FCF would be \$14,286 which is \$708 (4.7%) lower than the Euro FCF at average rates, and is \$1,111 (7.2%) different from Euro FCF translated at the period end rate. There are clearly many other possible permutations depending on the translation choices made for the underlying measures used, for example for depreciation and amortization.

Observation 4: Distorted Capex and Depreciation and Amortization numbers

In the examples, we assume that depreciation and amortization are translated at an average rate in the income statement. This depreciation number is used in the indirect approach in calculating operating cash flow, free cash flow measure and other commonly used measures like EBITDA. However, relying on the average rate implies that the sum of USD depreciation (or amortization) over time is not equal to accumulated depreciation in the balance sheet.¹² Hence, an argument could be made to use a rate other than the average rate given that depreciation is often not a specific line item in most income statements. In addition, as investments are usually not evenly distributed over time, the use of an average rate for capital expenditure will not conform to the accounting standards. The result is that capital expenditure will often be translated at a different rate to the depreciation number and useful ratios in USD such as capex/depreciation will contain measurement error.

¹² There is the additional problem that some of the depreciation in a cash flow statement may be capitalized in inventory or capital expenditures and the changes in inventory will often not be at the same rate.

The bottom line is that several profitability, earnings quality and cash flow measures are not free of measurement issues relating to currency translation. This observation leads us to ask several survey questions about how items that impact cash flow measures are translated and used in practice.

3.2 Exchange rate used in depreciation add back to indirect cash flow statement

One of our survey questions asks CFOs whether or not the company uses the same exchange rates for income statement and cash flow numbers. The question is framed as follows, “For local currency as functional currency subsidiaries, what rate do you use for add back of depreciation in the operating cash flow statement?” Table 2 suggests that the most common answer is the average rate used in the income statement (44%) followed by “don’t know” (38%). Very few survey respondents picked “year-end rate (as used for net PPE) (9%) and “rate on date equipment acquired” (6%).

Many of the respondents did not know the answer to this question. Such respondents potentially do not have subsidiaries where local currency is used as the functional currency. We believe this is unlikely to be the case for the majority of the qualified survey takers. It is more likely that most of the respondents are not actively involved in the preparation of cash flow statements and the issue is often deemed to be a technicality. Yet these numbers can be important in calculations for investors and creditors who use EBIT, EBITDA, Operating Cash Flow or FCF. Of those respondents that provided a specific answer, the majority indicated that the depreciation add-back is translated at the same rate as used in the income statement. This is consistent with the illustration in SFAS 95 and what we show in panels B and C of Exhibit 1. It means that any comparison of capital expenditure relative to depreciation is distorted by different exchange rates used for translation of the numerator and denominator.

For the 18.% of respondents who answered and used a rate that is different between the cash flow statement and income statement, their policy would introduce an additional “measurement” difference, as shown in Exhibit 2 (we use a different time-period to the exhibits to avoid complicating Exhibit 1 panels B and C and actual exchange rates on the relevant dates). The example in Exhibit 2 shows that adding back a translated depreciation (or amortization) measure using a different rate relative to the rest of income introduces translation differences that clearly have nothing to do with real cash flow.

As can be seen, in the first illustration in Exhibit 2, where the same exchange rate (\$1.125 per EUR) is used in both the income statement and in the indirect method cash flow statement, the depreciation add back in the cash flow statement introduces zero measurement error. However, in the second illustration, when the rates are inconsistent between the income statement and the cash flow statement (\$1.125 per EUR in the income statement and \$1.082 per EUR in the cash flow statement), the depreciation adjustment creates lower operating cash flows of \$86 without any real economic change in operating cash flows. This error would affect indirect approaches to measuring cash flow from

operations, EBITDA and Free Cash Flow. Conditional analyses indicate that the occurrence of this error is larger for private firms.

3.3 Exchange rate used to translate changes in working capital

To be very clear, as we show in Exhibit 1, the number that gets used in any translated USD cash measure does not reflect “real” cash flows that can be used or distributed to shareholders. The problem is exacerbated when we consider other components that go into measures of reported operating, investing, financing and free cash flows. In the survey, we ask what approach is adopted in practice for several key items, specifically: “what is the rate used to translate: changes in working capital, capital expenditures, debt issuance/payment, and capital issuance or repurchase: (i) change in translated balance sheet measures; (ii) the same rate as the income statement; and (iii) rates on specific dates of changes in the respective components?”

The results are reported in Table 3. 58% of those who responded on working capital changes indicate that they used the same rate as translated balance sheet measures (which is each period-end’s exchange rate). This answer suggests that working capital changes for the majority of respondents in the survey are contaminated by potentially significant measurement error associated with using year end rates to compute working capital changes (illustrated in the free cash flow calculation in Panel B of Exhibit 2). Conditional analyses suggest that such measurement error is systematically greater for firms for whom foreign contribution to their sales is low. 24% of the respondents say they don’t know. Interestingly, more of the “don’t know” observations are found among firms that claim to adopt the “middle” ground in terms of hedging foreign currency risk. 6% of the sample use rates on specific dates, 7.5% use the same average rate as used in income and 5% use some other average rate each of which could be consistent with SFAS 95. The natural question is whether these translation approaches reflect underlying cash flows or not?

Consider the simplified but more specific example illustrated in Exhibit 3, again using actual exchange rates at the time. We assume the Euro based working capital balance is constant at €10,000 at every quarter end. Hence, there is no net source or use per quarter from receivables but each quarter’s receivables are translated at period end rates to get a USD value for reporting purposes. The result is a volatile pattern of changes in USD working capital ranging from an inflow of \$1,350 in Q1 2015 to an outflow of (\$450) in Q2 2015. We illustrate the variation over time in Figure 2 which reflects the reported values of changes in working capital in Euro versus USD. Although there are no “real” Euro based cash flows, the USD measures based on balance sheet period end rates indicate sources and uses of working capital that are purely translation based. This measurement error occurs in addition to any other effect such as depreciation shown earlier.

Next, in Exhibit 3, we focus on the receivables balances and transactions within a quarter using Q1 2015 as an example with an actual cash flow of €0. We simplify the illustration by assuming that the beginning balance of €10,000 was collected in cash from customers on 2/1/2015. On 3/16/2015, the firm booked receivables for the same amount of €10,000 (as would occur if Euro sales are flat and the payment cycle is 30 days or less). However, the use of translated USD measures results in a reported positive cash flow of \$1,350 although there is NO actual underlying Euro based cash flow.

The example shows that \$1,350 of the exchange difference can be seen either as (i) the difference in the translated beginning and ending balances (\$12,170-\$10,820); or (ii) a result of the various transactions and the change in rates from the date the receivables arise and are paid relative to the quarter end (-\$880-\$790+\$320). If we used the translated rates on the day the cash flows occurred, which is the specific requirement of SFAS 95, then we would only see the \$790 source. Many senior executives and board members only review USD cash flows (as shown later in section 4.5) and investors, analysts and academics can only observe and work with USD cash flows as presented. *Hence, these parties will not be able to appreciate that the source of \$1,350 (or \$790) is not backed by any real underlying Euro cash flows.* Moreover, as we illustrated earlier in Exhibit 2, calculations such as FCF are also impacted. This case suggests the potential for significant measurement error in valuations or benchmark comparisons that rely on such metrics.

3.4 Exchange rate used to translate capex, debt and capital issuance

Consistent with the requirements of SFAS 95, most respondents use the same rate as the balance sheet for capital expenditure, debt issuance and capital infusions or repurchases (see Table 3). Because these tend to be sporadic transactions, their timing can be important to the reported cash amounts. This point is seen most starkly in the dividends paid in our example in Exhibit 1.

If we operate in a region with a declining currency, it may be unattractive to reinvest the capital we earn. Barring tax-related issues, it would be a good economic decision for shareholders if group management distributed current and retained earnings. In panel A of Exhibit 1, we assume that the company distributes all of the current income of €15,000 and €3,000 of retained earnings leaving €400 of retained earnings at the subsidiary. Because earnings are translated at an average exchange rate and the exchange rate has appreciated at the time of the distribution, *the actual USD paid out and received by the parent is higher* ($\$20,378 = €18,000 * 1.132$) than the \$19,615 of earnings and distributed retained earnings in panel B or \$19,575 in panel C.¹³ This gain of \$763 in panel B ($\$20,378 - \$19,615$) and of \$803

¹³ In particular, \$19,615 represents the sum of translated USD reported balances of earnings (\$16,358 in panel B) and of distributed retained earnings of \$3,257 in panel B (€3,000 of the €3,400 of opening balance of retained earnings at 1.0858 = \$3,257). Similarly, \$19,575 is \$16,318 of earnings from panel C and \$3,257 of distributed retained earnings from panel C.

in panel C (\$20,378-\$19,575) represents a realized (cumulative) translation adjustment that would be appropriately reflected as income. The final Euro balance of retained earnings will be translated into USD at the quarter end and the difference will be an additional USD translation adjustment. The benefit from distributing versus retaining the earnings created REAL return on the investment as the payout represents cash available to be used by the parent. *This illustrates that (i) translation adjustments on net investments are financial gains and losses; and (ii) the decision to leave the investment in Euros is a capital investment decision subject to financial risk.* The evaluation of this risk and exposure leads to a series of questions in the performance evaluation and hedging sections of the survey.

3.5 Senior managers and board members only see USD cash flows

Having illustrated the possibility of significant measurement error in translated cash flow measures, we ask what actually happens in practice? External users do not have access to the Euro data but, in principle, internal users, including senior executives and the board, could be given this data. Having said that, in most large organizations it is likely to be intractable, if not infeasible, to obtain and internalize disaggregated local currency data. Hence, the natural question to raise is what kind of cash flow data do corporate executives and board members use? To investigate this question, we ask, “Non-USD subsidiaries have local currency cash flows which are translated and incorporated into USD consolidated cash flows. Does your senior management (board) only see USD cash flows?” Despite the embedded measurement error in USD cash flows, the vast majority of survey takers stated they use USD cash flows. As shown in Table 4, 78% (86%) of the survey takers say that senior management (board members) only sees USD cash flows. Although the average levels of USD cash flow based reviews are very high, conditional analyses in Table 4 suggest that this tendency is worse for (i) private firms; and (ii) firms where a smaller contribution of sales comes from abroad.

In unreported analysis, conditioning on those respondents who answered that senior management uses only USD cash flows, we find that around 50% of them use average rates for depreciation, but exchange rates on period-end balance sheet dates for the other items. If we exclude those who “do not know,” these percentages go up substantially. *These results suggest that the cash flow measures consumed by a majority of senior managers in the sample contain several translation-related measurement issues as shown in the exhibits.*

3.6 Hypothetical survey question on cash flow reporting

Another way to assess how the respondents perceive cash flow measurement issues is to use a hypothetical example with various translation options. The hypothetical question asked in the survey, shown in Table 5 Panel A, asks the respondents to consider a subsidiary that operates in Europe with Euro as the functional currency. There are four basic alternatives to translate local cash flows to US dollars.

The problem lists the opening balance of Euros translated to USD at the exchange rate as of January 1. There is one Euro receipt on February 10 and one Euro payment on March 1 along with a closing balance of cash in Euros as of March 31. At each of these four dates, the USD: Euro exchange rates are different.

The four options, calculate USD denominated cash flows as follows: (1) translated closing balance minus translated opening balance (change in reported cash balances); (2) the sum of the translated transactions on February 10 and March 1; (iii) the change in Euro cash balance over the period translated at the weighted average exchange rate; and (iv) the change in Euro cash balance over the period translated at the period end exchange rate on March 31. Participants are asked to pick the option that would be reported to senior management/board of directors. An analogous question would be which USD cash flow measure should we use for assessing performance or for valuation analysis? The results are shown in Table 5 Panel B.

Option 1 (translated closing balance minus translated opening balance), which 27% chose, is the number that has to be included and reconciled to in a cash flow statement as per accounting regulations. Option 2 (the sum of the translated transactions on February 10 and March 1) chosen by 11% of the respondents is the treatment that is arguably closest to the original accounting rule in SFAS 95 as it reflects the rate when the cash flows occurred. Interestingly, in previous uses of this example with student and professional audiences where the focus was on the cash flow that they would recommend be used to report to the CEO, the vast majority of respondents, especially professional accountants, chose option 2. In practice, the cash flows would occur more evenly over time. Hence, one could argue that using an average rate might be more appropriate and still consistent with SFAS 95. Yet this argument would indicate the use of Option 3 (the change in Euro cash balance over the period translated at the weighted average exchange rate) which was chosen by only 9% of respondents.

The last option (the change in Euro cash balance over the period translated at the period end exchange rate on March 31) which 21% chose, uses the period end rate to translate the Euro cash flows. This practice is consistent with using a current spot rate as a (convenience) translation rate which is quite logical. However, using the spot rate is not consistent with the accounting regulations, and as shown previously, will be inconsistent with most other flow measures, creating more of the inconsistencies indicated in panels A-C of Exhibit 1. It is also notable that while five respondents who got to this stage of the survey chose to skip the question, 32% of respondents indicated they did not know the answer to the question.

Notably, 60 of the 66 respondents to the hypothetical survey question above indicated that senior management only sees USD cash flows. Given the wide variation in the responses to the hypothetical question posed here, these USD cash flows potentially reflect varying degrees of measurement error. To

reiterate, for most, if not all, of our respondents, the important takeaway is that the cash flow measure that senior managers and investors have access to and use is not a real cash flow measure in an economic sense. Furthermore, if senior managers use a cash flow measure that is not realistic, then it is unlikely that analysts, investors and empirical researchers have access to a “real” measure of cash or cash flow.

3.7 Some interview evidence

3.71 Choosing the functional currency

For financial reporting purposes, companies have to prepare consolidated financial statements. Given the complexity of multinational corporations with many transactions often in multiple subsidiaries and currencies, there is a need to aggregate data for internal performance measurement and evaluation as well. Hence, the question for both internal and external reports is how to aggregate data measured in different currencies? While rarely discussed, the core issue revolves around (i) whether the parent currency (USD here) is viewed as the appropriate unit of measurement (known as USD is the functional currency); or (ii) whether the parent currency (the USD) is just the unit of account used to aggregate and present economic measures of different operating entities (here the Euro would be the functional currency). This seemingly subtle distinction has significant implications for what is deemed to be exposed to currency impacts and that choice will impact many of the reported numbers, especially underlying net income.

If USD is chosen as the measurement currency (also known as functional currency), then non-USD transactions of the Euro-based subsidiary will be (re-)measured in USD as if the subsidiary were operating as a US company with non-USD transactions. The simplest example would involve a Euro sale on account (income statement item) that would be measured into USD on the date of sale and any Euro receivable (balance sheet item) would be exposed to changes in the USD-Euro exchange rate.¹⁴ But if the Euro-based subsidiary operates (primarily) in Euros, then many managers and users believe that (i) the profitability and potential of the subsidiary to generate cash flows should be measured in Euros; and (ii) the assets and liabilities, or revenues and expenses should simply be translated into USD. In that scenario, Euro would be chosen as the functional currency. Hence, the same Euro sale and receivable would now be recorded in Euros and be simply translated using one rate for all Euro sales in a period. The ending balance of receivables would be translated at the period end exchange rate. In practice, revenues and expenses are translated at the actual rates on the transaction dates (average rates for the quarter or year) when USD (Euro) is the functional currency.

On the balance sheet, under both systems, monetary assets and liabilities such as cash and accounts receivable, accounts payable and loans, would be translated at the USD-Euro spot rate at the

¹⁴ This accounting treatment was advocated in SFAS 8.

balance sheet date. Thus creating exchange gains and losses relative to the USD balances on transaction or previous reporting dates. When USD is the functional currency all other (non-monetary) assets and liabilities, such as equipment and intangibles, are translated at the date when the original transactions occurred and the equity reflects the original USD rates which will differ from the current (distributable) rate.

When Euro is the functional currency all non-monetary assets and liabilities are translated at the year-end rate. Pre-acquisition equity is eliminated on consolidation which creates a translation difference reported in other comprehensive income (OCI). As parent retained earnings articulates over time and thus reflects post acquisition historical rates, it will also create a translation adjustment that similarly is reflected in OCI and accumulated OCI. On distribution of retained earnings or other returns of capital the related cumulative translation adjustment (for Euro as functional currency) or difference in reported versus distributed equity (for USD as functional currency) will be reported in net income. In sum, the choice of the measurement or the functional currency (Euros or USD) will yield different USD based numbers in the consolidated financial statements.

Exhibits 1-3 rely on using the local currency as the functional currency. Several companies, including investment banks, use USD as their functional currency for some or all their subsidiaries.¹⁵ As indicated, the difference in the measurement of decision-relevant accounting numbers can be dramatic depending on whether the local currency or USD is used as the functional currency. In particular, a switch from local to USD as the functional currency, resulting from a newly deemed hyperinflationary country and currency, can have a large impact on measurement. The recent switch for Venezuela caused large losses in many companies, despite the relatively small size of the country. For example, in 2014, Coca-Cola recorded a \$372 million loss on the retranslation of its net investment in the Venezuelan subsidiary as a result of the switch and the prevailing rates. This loss accounted for 3.8% of pre-tax income for the year.

Most interviewed executives told us that they primarily rely on local currency of the subsidiary as the functional currency.¹⁶ A foreign exchange consultant clarified that “we often walk in to a client and

¹⁵ All subsidiaries in hyperinflationary currencies are required to use USD as the functional currency.

¹⁶ SFAS 52 lays out the basic principles on how firms ought to choose their functional currency. In early work, Revsine (1984) points out the danger inherent in SFAS 52 whereby firms might mechanically count up the specified indicators (such as cash flows, sales prices, expenses, financing or inter-company transactions) and pick the functional currency that loads on most of these indicators instead of understanding the theory behind the selection. Evans and Douppnik (1986) find that surveyed financial controllers rely mostly on cash flows, followed by sales, expense and sales price in picking their functional currency under SFAS 52. Douppnik and Evans (1988) conclude that standard-setters should specify how firms should pick functional currency to facilitate greater comparability among firms, although we do not believe their recommendation will lead to their stated objective.

are given an org chart with functional currencies against these units. Most times these are tax functional currencies. In 90% of the cases they are the same as book functional currencies but there are cases (10%) when they are not the same.” When asked whether he has seen the use of USD as a functional currency, the consultant replied, “rarely, these are usually holding companies that take on the functional currency of the parent company. But for tax purposes the currency used in borrowing or denominating transactions matters more.” Another CFO said that the foreign currency of the country they are based in is their functional currency because most of their customers pay in that foreign currency. However, their other important location invoices in USD and uses it as their functional currency. Their costs, are mostly in the subsidiary’s currency. Hence, it is not clear to them whether USD or the foreign currency is the “right” functional currency.

Another reason some companies use USD as the functional currency is that there was a period, especially prior to the establishment of Euro, when the revenues and costs occurred in many different currencies. If a few key costs or revenues occurred in USD, it was simpler to retain the USD as functional currency. While the choice of functional currency is supposed to be updated to accommodate changed conditions, companies are reluctant to change that choice frequently as switching costs, especially related to management information systems, can be high.¹⁷

3.72 Concern about inconsistent rates

We repeatedly heard that companies are worried about how the application of inconsistent foreign exchange rates in the financial statements affects the perceptions of outsiders. A foreign exchange consultant elaborated, “one of the problems is comparing apples to apples. If the income goes down due to foreign exchange, I remind clients that the balance sheet also usually goes down. So, if your analysts are running ratios of income statement to balance sheet numbers, we should be O.K.” Of course, this description is an over-simplification because the translation rate used for the income statement measures is the not the same as those used for balance sheet measures if the local currency is used as the functional currency.

In Exhibit 1 panel D, we show how profitability measures differ for the subsidiary’s local currency Euro results and the translated USD results. Notably, the annualized return on net operating

¹⁷ One example of such a legacy bias is Merck. A former CFO, Judy Lewent, was a proponent of USD as the appropriate functional currency and through her tenure as CFO (ending in 2007) Merck remained on USD as functional currency for all its subsidiaries. In 2009, Merck and Schering Plough merged. The latter, like most large international pharmaceutical companies, used local currency as functional currency for most of its subsidiaries. In 2010, Merck announced it was going to re-evaluate the functional currency of its subsidiaries and in its 2011 annual 10-K report it noted that, “as a result of the merger, the functional currency of the operations at each of the Company's international subsidiaries has been reevaluated and has resulted in a change in functional currency at certain subsidiaries.” (page 88)

assets (RNOA) is 41.7% for the Euro measures but after translation the USD based RNOA rises to 61.3%. In contrast, the return on equity (ROE) is 98.5% for the Euro measures but 97.7% and 96.4% for the translated USD data. These results suggest that, like the cash flow measures, using the translated USD data as a source of profitability analysis can lead to misleading results in the presence of exchange rate volatility, and not necessarily in predictable ways.

Another interviewed CFO, whose company follows IFRS, mentioned that his company uses the same exchange rate for both the income statement and the cash flow statement. His firm typically uses the prior month's closing rates for simplicity. They translate cash flows and income statement month by month. When probed, the CFO clarified that they translate smaller capex items at prior month end rate. For larger capex items, they use the spot rate on the day of the transaction, especially when they buy very large Property, Plant and Equipment items (PP&E). For debt issuance, they use spot rates. They have several finance leases for which they use the spot rate on the day the lease was booked. They run changes in rates on such leases through the income statement accounts. These comments related to one entity highlight the diversity in how foreign currency translation rates are used in practice and the potential for significant measurement error in how users of financial statements interpret cash flows originating in foreign subsidiaries.

An interviewed treasurer clarified that they use the quarter-end rate for the balance sheet items and the monthly rate for income statement items. The monthly rate is actually a rate set centrally by Treasury a month in advance. The treasurer's company uses market data and comes up with forward projections to determine that monthly rate. The cash flow statement would capture a blended rate, depending on whether the balance sheet items or the income statement items are reflected in the cash flow statement. The treasurer clarified that irrespective of the actual activity of the subsidiary there is no weighting done so the exchange rate is the same for all subsidiaries.¹⁸ It is worth noting that such a practice is inconsistent with GAAP.

3.73 "Senior management does not "get" foreign currency"

In interviews, with rare exceptions, CFOs mentioned that, when material, certain foreign currency splits are reported to the board and senior managers but external reporting of these impacts are rare other than isolating high level impacts for revenue and earnings. Most CFOs mentioned that the board, other than the ones with advanced financial expertise, does not "get" foreign currency, except at some high level. The interviewed CFOs suspect that investors don't get it either. One CFO expressed surprise that no investor has ever enquired about the size of the annual and cumulative translation adjustment. One

¹⁸ We often heard about the absence of weighted exchange rates, although this practice is technically a violation of GAAP.

CFO mentioned, “most CEOs care about net income or earnings and understand at a broad level that they have foreign businesses and foreign currency can affect earnings from those businesses but that’s about it.”

3.8 Isolating currency impact for managers, boards and investors

Given the impact that currency volatility can have on results we asked respondents whether material currency translation effects are isolated for the board and senior managers, and for investors and analysts. We identified specific items that we expected might be treated differently. As seen in Table 6 panel A, the majority of respondents isolate the effect for revenue and net income. As expected the proportions are higher for the board and senior management compared to investors and analysts (revenue 74.6% vs 63.7% say yes, net income 70.6% vs 58.8%). However, for operating cash flow, as well as specific assets and specific liabilities, the effect is mostly not isolated although the frequency with such isolation occurs is a little higher for the board and senior managers (37.0% for board vs 24.5% for investors). Operating costs are more mixed with 55.1% of respondents indicating that they isolate the translation effect for the board and senior management but only 38.0% do it for investors and analysts. The currency impact on assets and liabilities are seldom isolated for both the board and investors.

The fact that the minority of respondents isolate any translation effect for operating cash flows, together with the potential impact shown in Exhibit 2, reinforces the view that use of operating or free cash flow is likely to be distorted by currency translation effects. In interviews, we probed further to better understand the isolation of currency effects. Many of the interviewees answered that this was rarely done beyond revenue and earnings, and even then, it was done at a relatively aggregated level, unless there was some unusual impact. Given the complexity of the currency impacts, it is not that surprising that such an impact is not isolated. One interviewee of a medium sized entity with a relatively simple product suite indicated that they invested significant time and money in reporting systems to be able to isolate the currency effects.

In Table 6 Panel B we report the responses to the isolation question after conditioning on firm characteristics. Notably companies that are public, have higher revenue, larger foreign operations or give earnings guidance are more likely to isolate the currency translation effect. Firms that either have low or very high propensity to hedge isolate the effect less than the middle group. This is logical because the low group (i) probably has minimal exposure; (ii) cannot isolate currency impact easily; or (iii) is likely more comfortable with the volatility whereas the aggressive hedgers are likely interested in eliminating larger proportions of the currency effect.

One of the interviewed companies highlights the effect of currency on revenues and margins by segment with a broad indication of the region or currency having the largest impact. Most of the others

are much less transparent. One CFO mentioned that his/her company was more likely to highlight unfavorable impact of currency on earnings to investors and analysts: “I was heavily involved with IR. For instance, if there was a material currency impact, we would call it out for conference calls. Especially if the currency impact affected revenue. This was material for us because our growth rates were low. If currency affected the profit line, we would call it out in the conference call. We would not talk about it if the impact were favorable but that is normal for any corporation.”

3.9 Currency related earnings guidance

Experience suggests that some companies isolate a high level currency effect when they provide earnings (and revenue) guidance. Hence, we ask whether CFOs provide any indication of the expected currency impact when they provide earnings guidance to investors. 67% of CFOs claimed that they provide earnings guidance to investors. Of this 67%, only 53% said that they isolate the expected contribution of currency to the guided number (so the unconditional average is roughly 36%). On further probing in the interviews, most of the currency impact on guidance was at a high level and primarily given only if explicitly asked for by analysts or investors. Analysis of earnings calls and company presentations for companies which do give some indication show an impact at an aggregate revenue and (adjusted) earnings level usually with little detail on which currencies are causing the reported effect.

4.0 Exchange rate issues related to performance evaluation and hedging

4.1 Introduction and summary

It is commonly assumed that managers have complete information and can hence make decisions with total insight into the way the business’s financial data relate to the underlying activity of the firm. As several interviewees confirmed, this is rarely the case for multinational operations as the impact of foreign currency on financial information is complex and little understood by most internal and external users of financial data. In the exhibits and discussion below, we indicate where the complexity and difficulties arise to enable readers (i) to appreciate the context of the questions and responses related to performance evaluation and hedging; and (ii) to help understand how foreign currency volatility can impact analysis and decisions in business and research. The exhibits are simplified examples but demonstrate some of the nuances that our survey questions seek to uncover.

In particular, the exhibits and responses illustrate the following points: (i) the real economic exposure of the group is the net investment in the subsidiary (4.2); (iii) although we hear practitioners talk of natural hedges often, they frequently are limited in practice (4.4)¹⁹; (iii) when natural hedges occur at the consolidated level, it appears that the centralized treasury rarely passes the impact of these hedges to

¹⁹ Natural hedges occur through matching revenue and costs, receivables and payables, and assets and liabilities in general. While many companies have some of this few companies employ these extensively.

the subsidiary (4.5); (iv) to avoid reporting gains and losses in income, USD reporting groups have incentives to hedge USD receivables and payables at the subsidiary whose books have to be kept in a non-USD functional currency, e.g. in Euros (4.6); (v) currency related gains and losses on receivables and payables at the subsidiary are financing, not operating, transactions (4.7); (vi) identifying opportunity gains and losses affecting revenues and costs is difficult and often not done in practice (4.8); (vii) unsustainable growth in translated revenues and costs is often obscured or ignored (4.9); (viii) budgeted exchange rates can distort local manager's incentives and behavior (4.10); (ix) reported and forecasted profit margins at the subsidiary are distorted because of currency issues (4.11); (x) both transaction and translation effects can cause distortionary real effects (4.12); and (xi) complications arise when the subsidiary transacts in multiple currencies (4.13). A detailed development of these ideas follows.

4.1 The basic set up

For ease of exposition, we assume (i) that the reporting currency of the primary (parent) company is the U.S. dollar (USD); (ii) the parent may transact in other currencies but it has at least one subsidiary whose primary operating currency is not USD; (iii) for most analyses, the primary non-U.S. currency is the Euro. To appreciate the dilemma managers and investors face, we consider not only how historical measures are recorded but also the implications of exchange rates for any budget, target or forecast.

If the USD reporting parent transacts in a different currency, the parent has to record that transaction in USD. Assuming the parent purchases goods invoiced in Euros, it is natural to “convert” the Euros into a USD equivalent at the exchange rate prevailing at that time. The firm has the choice to pay the supplier immediately. If it does, the payment would fix the USD cash cost for the transaction. To the extent the firm chooses to pay on credit, the firm will become exposed to fluctuations in the USD-Euro rate until payment. Under current accounting regulations, any resulting gain or loss is reported in net income. This is the simplest case. But even here, it is easy to imagine exposure to exchange rate fluctuations stemming from (i) the rate used while setting the budget at the beginning of the accounting period; and (ii) rate at the time the order is placed. Moreover, the subsidiary can transact in Euros and other currencies including USD. We illustrate this case in Exhibit 4 where we also consider (i) implications for interim reporting periods; and (ii) the link to the parent's reporting.

4.2 One of the biggest economic exposures is the net investment in the subsidiary

It is important to appreciate that one of the biggest economic exposures for the parent company's shareholders is the net investment of the subsidiary (including retained earnings) as the real cash flow implications for the parent only arise when the capital is returned to the parent. The gains and losses from this exposure are currently reflected in a translation adjustment in equity. Such a translation adjustment is

only recorded in income when the equity is returned to the parent (via a dividend, repurchase or sale).²⁰ Although the underlying economic exposure affected is only the parent's net investment, as shown below, all aggregated net income and balance sheet measures will be impacted by the choice of functional currency. Such choice, in particular, distorts growth rates and any ratio that uses a mix of balance sheet and income measures such as return on equity (ROE), return on assets (ROA), return on net operating assets (RNOA), days sales outstanding (DSO) and inventory turnover (ITO). On top of that, all budgets, targets and forecasts will also be affected by the *expected exchange rate* chosen by the firm. The consequent distortions can have a real economic impact on decision making inside and outside the firm. We illustrate a few simple aspects of the translation impact at the bottom of the transaction analysis in Exhibit 4.

4.3 The basic transaction example

In Exhibit 4, we reproduce the subsidiary's books and assume (i) that the subsidiary uses Euro as its functional currency; and (ii) that sales and purchases are made by the subsidiary in both Euro and USD. We focus on a few transactions in one month, using actual exchange rates, assuming the reader can extrapolate to the added complexity of multiple transactions over a month, quarter or year.

Let's start with (i) beginning balances in Euro cash and inventory; and (ii) USD-invoiced receivables and payables. For expositional purposes, we identify each transaction or balance with a reference note as a letter or number. For example, in note A, the balance in USD payables was originally recorded as €9,000 although the real payable is \$11,065. Analogously, in note B, we start with a €10,000 receivable, which has an underlying \$12,500 receivable. These Euro balances are thus exposed to fluctuations in the USD-Euro exchange rate. Hence, in note D, at the balance sheet date, 12/31/2014, we reflect the Euro balances at period-end exchange rates. As the Euro is depreciating relative to USD, there is a net exchange gain of €179, recorded in current income (note C1). Importantly, while the net USD exposure is a receivable of \$1,435 (\$11,065-\$12,500), the underlying Euro amounts were recorded at different dates with different exchange rates it is not possible to estimate the recorded gain from the net exposure at the balance sheet date.²¹ In fact with volatile rates and different timing it is conceivable they could have had an exchange loss. In January, we show the payment (note E) and receipt (note H) of the December USD balances which results in a Euro loss of (€182) and gain €585 respectively. The large difference results from the different times (and hence rates) for the payment and receipt even though it is in the same month.

²⁰ SFAS 52 requires firms to pick a functional (measurement) currency and mandates such a treatment.

²¹ €179 reflects the net gain from two items: (i) the depreciation of the Euro for the underlying USD based purchase which was \$0.012 (\$1.229 - \$1.217) between December 7 (the purchase date) and December 31 (period end date); and (ii) the depreciation of the Euro for the underlying USD based sale which was \$0.033 (\$1.25-1.217) between December 17 (the sale date) and December 31 (period end date).

We also record transactions during January in Euros and USD which we describe with the relevant insight in the following sub-sections. We show the period-end adjustment again for the USD receivables and payables at the end of January, the next reporting period-end, which results in a net exchange loss of (€231) (note C2). Some important takeaways from these examples are as follows:

4.4 Comprehensive natural hedges of transactions are rare

“Natural hedges” from net transaction exposures are only effective to the extent that the exposures occur on the same date (or at least at the same rate). For example, had the USD purchase and sale both occurred on December 7, the net receivable of \$1,435 would have accrued a transaction gain of only €17 (exchange difference between December 7 and 31 was \$0.012 per Euro). The “natural” hedge is in place once the underlying dollar exposures are translated to Euros on the same date (period end). Given the usual timing difference between purchases and sales and the payments on account, the degree of natural hedging is a function of the underlying operating activities and credit practices of the subsidiary. Interviews suggest that this point is not fully appreciated by many of the executives.

4.5 Does centralized treasury pass on natural hedge impacts to individual subsidiaries?

As interviewees described, several companies use centralized exposure management to take advantage of netting offsetting exposures in multiple subsidiaries in a group. For example, imagine that the USD receivables originate in one Euro subsidiary and the USD payables originate in a different Euro subsidiary. The group’s exposure would remain unchanged from the example in Exhibit 4. The consolidated results will reflect offsetting gains and losses and group management can judge their exposure on that basis. However, each subsidiary’s management will be exposed on their own USD balances unless the centralized treasury function passes the offsetting gain or loss on to them via an inter-company invoicing arrangement. Failure to pass on the gain or loss can create conflicting incentives for local versus group management, when both are evaluated on USD results. Interviews suggest that centralized groups in firms rarely pass on such gains or losses to their subsidiaries.

4.6 USD reporting group might perversely want to hedge USD receivables and payables

Intuition suggests that if USD were the measurement currency, we would not expect any exchange gain or loss on the USD based receivable or payable. However, when USD is the reporting currency, the Euro exchange gain (in C1) or loss (in C2) will be reported as a group gain (loss) as the Euro amounts will just be translated (usually at an average rate) like any other Euro income item. The group will also report a translation adjustment as the earnings are retranslated at period-end rates at each balance sheet date (see also Note Q discussed below). To avoid these exposures, the group would have to hedge the payables and receivables. To some, this may seem strange because the payables and receivables are still invoiced in USD and the company is a USD reporting group. One can debate whether the cash consequences to the parent are real, but, in most geographical jurisdictions, the exchange gains

and losses are taxable. Hence, it would be impossible to suffer no cash consequences on this transaction without an appropriate hedge. This would be the case even if USD was the functional currency for group reporting purposes.

4.7 Are exchange gains losses on receivables and payables financial gains/ losses?

We assume that both the USD receivables and payables are on one-month payment cycles. Hence, the first transaction we show post year-end is the payment of the USD payables (note E). The actual cash paid is the balance of \$11,065 but the Euro subsidiary would need to pay €9,271 given the prevailing rate that day. The payable in the Euro account at the year-end rate was €9,089 which leads to an additional loss of €182 at the time of payment (€9,271-€9,089). Should these losses be capitalized into the cost of inventory purchases and hence considered an operating cost? Analogously, on January 17, 2015, when the exchange rate was \$1.152:€1, the company received a payment for the \$12,500 receivable outstanding at the end of December (note H). The total received was €10,854 resulting in a transaction gain of €585 for the period since December 31 and a total gain of €854 (8.5%) from the date of original sale, spread over two reporting periods. Again, a question relates to whether this gain should be recorded as part of revenue given that it relates to cash from customers?

For both cases, we believe the gains (losses) should be considered as financing, as opposed to operating, transactions because the managers chose to leave the payable and receivable exposed to currency volatility. We have spread the transaction origination and payment over two periods to demonstrate that it would make little sense to adjust the revenue or cost of the same inventory post year end. This would be especially true if the inventory had already been sold. Among the questions we ask is whether central and local managers have such financial gains (or losses) included in their performance measures on which compensation is assessed (section 6.1).

4.8 Difficulties in isolating gains and losses affecting revenues and costs

While the transaction exposures on payables and receivables may reasonably be considered financial exposures, the exposures to exchange rate changes also affect actual revenues and costs. Appreciating this point is also important for internal and external users interested in forecasting future targets or results. We begin by considering the purchase of additional goods in USD and in Euro. On January 10, the company purchases (on one month's credit) \$13,010 of goods which are recorded as inventory and payables of €11,000 based on the exchange rate at the time of purchase (note F). From the date of the purchase through to the payment date, the exchange rate fluctuates. Hence, by the end of the month, the Euro payable for the USD purchase has risen by €520 (4.7%), and assuming we prepare a monthly balance sheet, we record an exchange loss in income. As suggested above, we would not include such a loss in the cost of inventory as it relates to a financing decision to leave the payables unpaid or at least unhedged. If local managers are evaluated on net income, they will want to mitigate this risk.

However, exchange rate volatility impacts the cost of USD purchases in other subtle ways. Usually goods are ordered in advance of receipt. Assume the goods were ordered on January 10 and received on January 31, the Euro cost would have risen by 4.7% and, if unhedged, the company's inventory cost would be higher as a result of the exchange rate changes. In this case, the event is still a transaction exposure but the impact is included in the cost of goods, and only very sophisticated systems would record and retain the information needed to isolate this component. This change in costs will impact margins and make it difficult to set targets or prepare forecasts of future costs, especially as, shown in the rate graphs in Figure 1, exchange rate changes can vary over short and long horizons. Further, as we shall discuss later, we need to choose a rate for budgeting or forecasting, and that choice will clearly impact the variance between expected to actual outcome, unless hedged (section 4.11).

4.9 Unsustainable growth rates in translated revenue and costs

To demonstrate the difficulty in isolating the foreign exchange rate impact in certain situations, we assume that on January 12, two days after the USD inventory purchase, the company purchases goods and services for inventory that costs €15,000, invoiced in Euros (note G). Hence, at this point, the cost of inventory available for sale is €34,500 which is what most domestic (Euro-based) managers and investors would see. Most USD-based managers and investors will rarely see the disaggregated Euro information. We also introduce a cost for salaries, wages and other costs in note L. These would often be denominated in the functional currency (Euro) and hence only be impacted by the exchange rate changes from translation. This typical but simplified example of a combination of costs at different times and currencies explains why we ask respondents what exchange rate impacts are isolated for costs.²²

Next, following the transaction sequence, we shift the focus to revenue which is a starting point for much analysis. We assume USD and Euro sales in the Euro business. In particular, we assume that sales of €35,000 on January 18 are invoiced in Euros (note I). Then on January 22, we record a sale of \$12,500 measured as €10,780 (note K). As we see from the example, the equivalent \$12,500 USD sale in 2014 was recorded as €10,000 (note B). Hence, anyone looking at the Euro revenues would see a one month growth rate of 7.8% for the USD portion of the sales or 1.7% for total sales (assuming the Euro sales were also constant). Yet this growth has little to do with operations and is unsustainable.

The situation may get even more complicated to discern when we only see quarterly data in USD as the total revenue measured in Euros on specific dates is usually translated to USD at a weighted average rate to report consolidated results. The USD portion of €10,780 will be translated as \$12,127 in the quarterly reports versus the original \$12,500. The USD translated measure of the €35,000 sale would also be reported as \$4,337 (10%) less in the first quarter (than quarter 4 of 2014) due to the depreciation

²² In all cases, there can be real effects from exchange rate changes from competitive pressures due to relative prices. We are ignoring this added complication in everything we consider.

of the Euro. Hence, despite the underlying business staying constant, the sales reported in Euros would reflect growth and the sales reported in USD would reflect a decline. This example illustrates why we ask questions to understand (i) whether central and local managers have such transaction gains and losses included in their performance based compensation; and (ii) whether the exchange rate impacts on revenue and receivables are isolated for various users?

4.10 Budgeted exchange rate can distort local manager's incentives and behavior

There are other important insights we can glean from this analysis. It is a straight forward transition from the above example to appreciating the difficulty foreign currency creates in budgeting and forecasting. Many practitioners and professors in classes/textbooks forecast revenues based on some historical basis (e.g. last n period average) and then project costs (and some balance sheet items) as a percentage of revenue.²³ For budgets and targets based on internal data, managers could potentially use more specific data. But going back to Exhibit 1, consider the Euro and USD sales in Q1 and think about how we could set a budget from this data.

The first question is whether to set the budget in Euros or USD. With either choice, non-local currency transactions require managers to select expected exchange rates. If the subsidiary, local or corporate managers or board members are required to use USD budgets, then it is necessary to set expected exchange rates.²⁴ We begin with the simplest case of Euro-denominated sales in Exhibit 4. The sales in Euro would usually only be translated to USD at the end of a quarter (or year). If the quantity and Euro price underlying such sales stayed constant from the previous quarter, we might be able to get an accurate forecast in Euros. However, we also need to come up with a forecasted quarterly average exchange rate to derive the translated USD forecast.

Many practitioners use the historic USD-Euro rate(s) for the forecast. However, the pattern of quarterly average exchange rates in the following period will have to be coincidentally equal to the previous average or period-end exchange rates to get the equivalent translated USD sales. In the three graphs shown in Figure 1, we show the pattern of quarterly (and annual) average and period-end exchange rates for 2014 through 2016. 2014 was clearly the year of a big structural shift but quarterly

²³ The authors do not advocate this practice and believe it is contradictory to economic logic and reality.

²⁴ An interesting contrast in perspectives on how to set budgets was found with two companies that had significant operations in Latin American countries with relatively high inflation. In one company they begin by using the rate established at the beginning of the year (e.g., for a 2017 budget they use a rate set at the beginning of 2016). They start considering local currency growth and incorporate inflation at the local level but do not adjust for the expected exchange rate change that goes with it. Then the exchange rate is adjusted once the budget is completed and the year begins. The other company ignores local inflation but uses a forward rate to deliver a "certain" USD budget number that incorporates USD growth with the expectation that expected inflation is reflected in the forward rate.

averages in 2015 relative to 2014 and those in 2016 relative to 2015 reflect a volatile pattern. It would be almost impossible to accurately predict these exchange rates using historic patterns.²⁵

Depending on how the target rate is set and how the exchange difference that arises in translating the Euros to USD is used in evaluating actual to target (or prior period) performance and compensation, we could observe significant volatility and “misses” at least in the USD measures. Such misses would impact managerial evaluations and induce managers to hedge or change their behavior to mitigate these translation risks.²⁶

4.11 Errors in forecasted margin

Currency exposure on margins arise because (i) some of the costs are invoiced in USD (this could easily stem from suppliers in USD-linked currency countries); and (ii) there is usually a time lag between purchases and sales. For example, the €9,000 cost from USD purchases in December 2014 (note A) would have risen when purchased again on January 10 2015 to €9,275 i.e. by 3% as a result of exchange rate changes. If the mix in the COGS remained constant, using a historical margin and budgeted or forecasted margins would clearly generate erroneous measures that obscure true performance.

4.12 Two exchange rate impacts can lead to distorted real effects

To be clear, there are two exchange rate effects underlying revenues and costs: (i) the exchange rate changes that occur for non-functional currency transactions as these have direct income and cash implications (i.e., USD or sterling invoiced transactions); and (ii) the exchange rate effect when these and other functional currency amounts are translated for reporting (and decision-making) purposes into USD, usually at an average rate for most income items, period-end rates for balance sheet items, and a mix for cash flows. Distortionary real effects can occur when decisions are made using the translated (versus operating currency) measures.

4.13 Complications from multiple currencies

From our example, it may seem that the impact of the USD on Euro income is somewhat muted because we have costs and revenues in USD (albeit at different dates). But the problem is often much more complicated in practice because there are usually transactions in currencies other than the parent’s and the local subsidiary’s currency. For example, in the Eurozone, there are several countries that are not on the Euro, most notably sterling. Local European subsidiaries also transact in currencies such as the yen and Chinese renminbi. In such cases, the cross-currency changes can add to the complexity and to

²⁵ The volatility is much greater for other currencies where U.S. businesses have significant operations including the Brazilian Real, Venezuelan Bolivar and the British Pound.

²⁶ The problem becomes tougher for sales invoiced in USD as even for a target in Euros, an expected exchange rate would have to be used to derive the revenues in Euros. On top of that, there is a need for an understanding of payment terms for any unhedged USD (or other non-functional currency) receivables (and payables) that create transaction gain and losses.

the decision as to what to hedge, i.e. to the functional currency of the subsidiary and/or the reporting currency of the parent. We use a hypothetical example in the survey to assess which currency, if any, do CFOs hedge to (section 7.21).

The next three sections of the paper document how executives in practice resolve the issues raised in this section.

5.0 Budgeting and Performance Evaluation

The measurement and reporting complexity detailed in sections 3 and 4 raise questions of how foreign currency volatility is treated in performance evaluation and the setting of targets, and whether firms proactively manage this risk via hedging. We ask several questions to address these issues beginning with setting the rate used in budgets or targets as budgeted rates can also influence the performance evaluation process.

5.1 How are budget rates set in practice?

Sections 3 and 4 highlights how currency can impact most reported measures. If budgets or targets are set for management of resources at the subsidiary, then a “budget” exchange rate must be chosen. In the simplest case, one could set a rate for translation purposes only and the transaction exposures are just viewed as part of the uncertainty of business. Even in the simple translation situation, there is a question of whether to provide expected average rates and period end rates. Forecasting exchange rates is difficult, but in principle, at least for the major currencies, one could use forward rates (curves) to set expected rates as these reflect equilibrium market-based expected values and can be “fixed” via forward, option or swap contract hedges.²⁷ But, as demonstrated in section 4.11, if managers wanted to avoid all impacts of foreign currency volatility in their forecasts, they would need to forecast (i) all transactions and payments/receipts in non-functional currencies; and (ii) the quarterly forecasts of the functional currency amounts in all income statement and balance sheet categories. Even then to get to any functional currency earnings or equity measure the items in (i) still need to be converted or translated at a forecasted rate. Hence, it is almost impossible to avoid some impact on reported budget results from volatile exchange rates.

A second issue is who sets the budgeted rates and how they are chosen? As the management of foreign exchange exposure has become more centralized with enhanced information systems, it would seem to make sense for the rate to be set centrally in the finance function. But local managers may better understand the local economies and might have different views of the “realistic” exchange rate, especially for non-major currencies. Further, if the gap between target and actual rates is large, local managers may

²⁷ In a presentation to a class several years ago, the CFO of a division of a Fortune 50 US multinational explained how he took out weekly forward contracts for the last few months of the year because he felt the local currency had reached a peak and he wanted to ensure his USD results remained strong. He reportedly paid several million dollars in transaction costs for these contracts.

adjust their behavior to manage to the target rate rather than the actual one. This can also happen when realized rates deviate from target or expected rates and no updates in targets are made.

One example of the issue was provided in an interview conducted before the survey was created. The treasurer of a large multinational with significant operations in non-parent currencies described setting the rates for budget purposes based on his perception of macro forecasts and what various economic pundits thought. This budget rate deviated significantly from the spot or forward rates but became the benchmark for the operating units and their targets. When asked if he was investing treasury funds based on his forecast, he indicated he would not as the budgeted rate was too far away from market rates. However, he still expected the local operating managers to use his forecast! Managers of three subsidiaries operating in non-parent currencies expressed their frustration with these rates and indicated that it negatively impacted some of their operating decisions.

5.12 Who sets the expected rate?

Table 7, panel A shows that in the surveyed sample, rates are generally chosen by the CFO (40%) and/or Treasurer with Controllers (29% and 14%) respectively. In the “other” category (11%), the financial planning and analysis group was mentioned several times, reinforcing the centralized nature of the budget setting. Only 11 respondents noted that the *local* CFO or Treasurer were included in the decision. To reiterate, if the expected rate is set at a central level such as Treasury and local managers have different views of the “realistic” exchange rate or the rate moves away from the target rates, then such movement can lead to potentially value decreasing decisions at the local level. This problem would seem to be most acute if the projected rates do not conform to market rates (e.g. forwards).

Untabulated conditional analyses show that in public companies, the CFO and Treasurer are most likely to decide on the budgeted rates whereas for private companies, the CFO clearly dominates. One explanation for this result is that a number of private companies in the sample do not separate the CFO and the treasurer functions. This pattern is consistent also with the size of revenue. We are wary of interpreting the local CFO or Treasurer category given the small number of responses in this category.

5.2 Interview evidence on rate setting

5.21 Two models of rate setting - centralized and decentralized

A foreign exchange consultant with a Big Four firm, who has worked with several Fortune 500 companies, stated, “Usually we see one of two models. In the “paternalistic” model, which is usually found in the more advanced company, the treasury will assure the sub of some kind of peso-\$ rate for the year. They tell them we will deal with the foreign currency issues here at treasury. Even here, most of the treasury groups are quite dissatisfied with the nature of their hedging operations. In the more “decentralized but less sophisticated” model, the head office will say that we will base your evaluation in terms of USD. Till recently, this blissful ignorance actually helped the foreign sub because they got a

facelift thanks to the weak USD. Hence, in USD terms, the foreign sub's performance looked much better than it actually was. This model is now running into trouble given the strength of the USD in recent times.”

An interviewed CFO articulated the centralized process followed to pick exchange rates in his/her company: “The Controller or the Planning group set the rates. After the crisis in our company, many things were centralized. Earlier, every regional group had its own accounting unit and they did not report up to the CFO. Previously people could project the foreign currency rates by themselves. Our CEO consolidated all of that. You could not make up your own number. Planning got the database for us. We had six to eight sources of getting the FX data. There was a standard way of consolidating that data.”

5.22 Frozen or constant rates

Several firms suggested that they consider performance at constant and actual foreign currency rates. That is, they rely on some version of normalized foreign currency rates such that local subsidiaries are effectively assessed on variances in the volumes they generate or they are evaluated against a budget number that relies on a frozen exchange rate set earlier in the evaluation period. However, given the examples in Exhibit 4, it is not clear how this can be done unless there are dual accounting systems.

For an example of the former, the CFO of a global airline said they rely on “normalized foreign currency levels.” That is, when comparing flying performance year to year, as is common in the aviation business, they keep foreign currency rates constant and they only assess variances in volume. Specifically, they multiply prior year's volume by the prevailing foreign currency rates and compare that with this year's revenue. In effect, they eliminate the effect of foreign currency rates.” However, they are still compensated on actual parent currency performance targets.

In contrast, a CFO of a major multinational provides an example of frozen rates: “we set rates during the planning period in July/September for the following year. There is a formula used to set these rates. It is not arbitrary and it takes market data on currencies into consideration. Local managers have to explain actual variances versus these planning rates only.”

5.23 Using consensus or forward rates

When asked what data source CFOs used to set budgeted rates, several interviewees said they had historically used consensus forecasts from Bloomberg with some adjustments but had given that up as these were perceived to be no more accurate than the spot rate. One interviewee stated, “basically no one had a clue so it was better not to guess.” Several also commented that they did not use forward rates because (i) that practice did not lead to good forecasts ex post; and (ii) they did not use forward contracts in practice. Many interviewees added that forward rates were not readily available in some currencies. When we probed further to ask if they would consider as-if forward rates based on interest-differentials interviewees viewed the rates to be unrealistic or “too high”.

5.24 Communicating expected rates to investors

We asked interviewees how they discuss expected rates with investors. One CFO explained: “when talking to investors, the idea was to communicate that if rates stayed where they are, here is what the performance numbers would look like. This information was meant to help investors come up with their own projections should rates change.” When asked whether the expected rate incorporated hedges, the CFO responded, “I would jump on the call when the question involved taxes or foreign currency. We did not get into the weeds of what was hedged. We never told them what short term or long term exposures were hedged. The rate included whatever we could pin down. I can tell you that investors did not get it, in general.”

5.3. Implications of the evidence

In sum, as expected, most companies centralize the setting of expected exchange rates. We believe that relying on expert forecasts or even market based expected rates implicit in forward rates or relative interest rates is unsatisfactory because such rates are unreliable in forecasting ex-post realized rates. Most companies appear to rely on a simple spot rate or a single expected rate.²⁸ In times of volatile exchange rates, unless hedged, realized results would differ from forecasts and from earnings guidance based on such forecasts purely because of exchange rates, irrespective of any underlying activity.

Given the inevitable effect of exchange rate changes on performance measures, the natural follow up question relates to whether the foreign exchange impact was ignored or incorporated in the manager’s performance evaluation and compensation decisions.

6.0 Performance evaluation

6.1 Factoring FX fluctuations in compensation decisions

The theoretical literature is unclear on whether managers’ compensation should be shielded or exposed to “uncontrollable” arguably exogenous forces such as oil prices or foreign currency fluctuations. The argument for filtering these forces out is akin to those made in the relative performance evaluation literature (Gibbons and Murphy 1990; Janakiraman, Lambert, and Larcker 1992; Aggarwal and Samwick 1999). As Bertrand and Mullainathan (2001) point out, the optimal incentive scheme filters out observable luck from performance because (i) the agent has no control over such observable luck; and (ii) tying pay to luck actually costs the principal more because the variance of the incentive scheme is higher, and the principal must increase mean pay to compensate the risk-averse CEO.

6.2 A suggested model of responsibility sharing between centralized treasury and the subsidiary

²⁸ Du Tepper and Verdelhan (2017) shows that post the credit crisis covered interest parity is systematically and persistently violated among G10 currencies.

We believe that one can differentiate expected (insurable) exchange rate changes especially for major currencies from unexpected changes that result from differences between the insurable and actual rate. The group can effectively provide itself and the subsidiary with a “fixed” exchange rate (albeit that it may change each period) and charge the business for the cost of that “insurance.” Such a procedure ensures that local managers concentrate on managing local operations to the parent’s expected currency rate and let the parent worry about how to manage unexpected risk exposures. A question still arises as to how long such “fixed” rates should be given for. We believe a natural period to provide such a fixed rate to the subsidiary is the operating cycle of that enterprise, specifically, the period over which capital, production and pricing decisions cannot be adjusted. Any structural shifts in the currency rate would be incorporated into a future expected rate in the “next” budgetary period of forecasted data. This approach separates responsibility such that (i) local managers are accountable for expected rate changes; and (ii) the centralized financial management is responsible for deciding what positions to hedge and for managing the un-hedgeable exchange risk at a portfolio level.²⁹ Note that if exchange rate exposures are aggressively hedged, then the rates underlying the hedges should be used as the forecasted rates, and that these will follow a time-based curve rather than be a single rate.

6.3 Survey results

6.31 What we expect to observe

Table 8 Panel A summarizes the responses to our survey question on whether transaction and translation gains and losses are ignored in compensation/bonus decisions of both corporate executives and local managers. We expect the responses to be partially influenced by the ease with which these items can be isolated. Transaction gains and losses in earnings are easily identified as they are explicitly recorded and included in earnings. As seen in Exhibits 1, 2 and 4, the translation impact is more complex. For income statement items such as revenue, translation creates a variety of difference from the underlying measures arising from use of an average rate for the translation of the local currency amounts.. This is relatively straight forward to isolate for revenue if reporting systems keep track of the invoicing currency.

Uncovering the translation impact for costs is more complicated because of the way these are disclosed. For example, cost of goods sold includes labor, materials, depreciation and other allocated overheads and rarely does any accounting system retain the original currency for any specific component (see section 4.9 and 4.10 as well). Exhibits 1, 2 and 3 also show that cash flow statements include simple translation impacts and a net gain/loss to reconcile the beginning and ending reported cash balances in the

²⁹ This approach can be implemented via a centralized treasury re-invoicing center.

reporting currency (USD). To prevent our survey from getting too long or complex, our question does not separate the elements of costs within each income statement category.

6.32 No manager is apparently held explicitly accountable in a significant majority of firms

Looking at the full sample in Table 8, we find that respondents are basically split on whether they ignore transaction gains and losses for evaluating corporate executives and local managers (44.7%-53.27% say that transaction gains and losses are ignored while evaluating both local and corporate managers).³⁰ The only measure for which there is a slight majority of cases where the translation effect is ignored is reported revenue. These data imply that in more than half the surveyed firms, no one other than the shareholder is explicitly held responsible for transaction and translation gains and losses. Remarkably, CFOs do not appear to discriminate between transaction gains and losses from nuanced translation impacts related to revenues or costs (sections 4.8, 4.9 and 4.10).

In untabulated analyses, when we condition the results on key firm characteristics, a more nuanced picture emerges. Fewer respondents ignore the impact of foreign exchange fluctuations in private firms. There are at least two potential reasons for this finding. First, smaller firms have less sophisticated systems and hence find it harder to track all the foreign currency impacts. Second, in private (and possibly smaller) companies, owners are less concerned about short term earnings and want their corporate executives and local management to take responsibility for managing the impact of exchange rate volatility.

6.33 Translation gains and losses in OCI

We ask whether translation gains/losses in other comprehensive income (OCI) are ignored in compensation and bonus decisions. Such gains/losses result from the decision to leave the net investment in the subsidiary exposed in the functional currency. Hence, contrary to the argument that the translation adjustment is not under management control (Rees and Shane 2012 table 2), as we show in Exhibit 4 central management can avoid this adjustment by financing the subsidiary with local funds. Such a move would then put the local subsidiary on an equal footing with its local competitors and would also make local managers accountable for the funding costs implicit in expected exchange rate changes through interest rate parity. We believe translation adjustments are a real financing cost and corporate executives should be responsible for such costs.³¹ Although past research is mixed on whether the market prices the

³⁰ While concerned about potential misinterpretation we based the question on ignoring gains and losses because this is the conscious decision that a board or managers would need to make, i.e., as the reported results incorporate any foreign currency impact they have to be explicitly isolated to be excluded. In our interviews, we elicited answers that confirmed that the question was not misinterpreted.

³¹ An argument we have heard is that as the capital is “permanently” invested the gains and losses even out over time. This is false reasoning as it creates an arbitrage opportunity to rely on local financing when exchange rates are high (in favor of the parent) and revert to parent currency financing when the level reverses. Further, if managers know this ex-ante, they should manage their treasury investments to exploit this apparent arbitrage opportunity.

translation adjustment in OCI (Soo and Soo 1994, Bartov 1997, Louis 2003, Sabac et al 2005, Chambers et al 2007), several of the studies find that the stock market considers the translation adjustment as a change in firm value.

In Table 8, panel A, our respondents are mixed, on average, on whether their managers are held responsible for translation gains and losses in OCI (46.0% for corporate executives and 47.1% for local managers say they ignore this). However, in untabulated analyses, we find a clear and a statistically significant difference between the private and public companies in that private companies are much more likely to hold managers responsible for the adjustment in OCI (only 31.4% ignore in private firms relative to 53.3% in public firms). The economic logic for this is borne out in the series of panels of Exhibit 5. Panel A of Exhibit 5 shows the case where a Euro subsidiary is financed totally with equity from the parent. Because all the equity is exposed, a translation loss arises from both the capital stock and the retained earnings. This loss (using actual rates) is about 2/3rds of the subsidiary's income $(\$18,659)/\$27,903$.³²

Panel B of Exhibit 5 shows the switch to Euro borrowing from third parties which imposes an interest cost on the subsidiary and eliminates the capital stock exposure, although if earnings is retained, this translation exposure still exists but is much smaller $(\$1,989)$ v/s $(\$18,659)$. Panel C of Exhibit 5 shows all the exposure is eliminated if earnings are distributed to the parent. Naturally, if there is no parent equity, it may be difficult to borrow the funds locally³³. Hence, in Panels D and E of Exhibit 5, we show the case where the parent lends the Euros to the subsidiary and simultaneously enters into a hedge to insure the exchange rate on the date the loan is made. Panel D illustrates the case where there is no dividend payment and Panel E reflects the case with a dividend payment. Once again, we see that the translation adjustment is eliminated. In our view, the cost of the hedge should actually be “charged” to the subsidiary.

6.4 Interview evidence:

None of our interviewed CFOs managed their treasury investments in a manner consistent with their implicit assumptions about how exchange rates will behave that are embedded in their budgeted exchange rates.

³² A subtle point needs elaboration here. These exhibits assume that the local currency is the functional currency. If USD is the functional currency, these translation gains and losses on revalued local equity will not appear in OCI. Because local equity is not revalued at year-end exchange rates, the actual dollars that shareholders can repatriate from the local sub will differ from the recorded value. Without an explicit disclosure (which is very rare in practice), it is difficult for an outsider to even estimate the magnitude of such differences. Because the accounting system does not explicitly capture such economic differences stemming from devalued equity in the local subsidiary, it can become even more difficult to make managers of ‘USD as functional currency’ firms accountable for such differences.

³³ The head of global capital markets of a large global investment bank confirmed that a credit-worthy parent can raise funding in local currency of a subsidiary (in many currencies) by providing a credit guarantee to the lender.

Interview evidence on this question also revealed substantial variability in the responses of executives:

6.41 Hybrid model:

One CFO revealed that both corporate executives and divisional managers were held accountable for transaction level gains and losses in earnings and for foreign currency translation impact on revenues, costs and earnings. However, for both these sets of executives, cumulative translation adjustments (CTA) were left out of performance evaluation although he thought local managers and executives should be evaluated on CTA impact as well.

6.42 Shielded from foreign currency fluctuations

A CFO of a non-U.S. airline company clarified that “US airlines don’t factor in foreign currency gains or losses in general while evaluating or compensating their managers because a vast majority of their transactions are dollar denominated and they have an aversion to assessing comparative performance by normalizing foreign currency rates as done by my company.”

6.43 Fully exposed to foreign currency fluctuations

In one executive’s firm (which happens to be privately held), management is responsible for an absolute target, so they “have to internalize fluctuations in fuel prices and foreign currency.” This year, they know they will miss the target number because of fuel prices. Fuel prices have fallen but their company had hedged them at a higher price per barrel.”

He went on to suggest that they could have a massive year but get paid no bonuses or they may have done poorly but get a big bonus depending on which way foreign currency rates and fuel prices went. One way the company manages this uncertainty is a multi-year compensation scheme. The multi-year scheme smooths out the year-to-year volatility in foreign currency rates and fuel prices. They have four-year compensation schemes in addition to an annual incentive program. When asked how deep down in the firm do bonuses on these volatile performance numbers go, the CFO mentioned that airlines are unionized. Pilots participate in profit sharing programs but they tend to discount the value of such programs as they believe that they will get these profit-sharing bonuses only once in a while due to the volatility in fuel prices and FX.

7.0 Risk management and hedging

As discussed in Geczy, Minton and Schrand (1997) [GMS], managers, debt and equity holders potentially have incentives to use currency derivatives, although they do not differentiate hedging from speculation. With no information asymmetry, hedging would potentially be superfluous as investors could undo the firm’s risk management strategies. DeMarzo and Duffie (1991) formalize the argument and show that hedging can reduce the variance of a firm’s payoffs (and its earnings or cash flow). Our exhibits illustrate how it is infeasible for investors and realistically managers to be informed of all the

exposures on an ongoing basis. This intuition is confirmed by the survey responses which show that most corporate executives and local managers review only translated data (section 3.5) and, in many cases, are held accountable for at least some of the foreign currency exposures (section 6.32). Because our anonymous survey does not allow us to gauge hedging activity of a firm directly, we assess a firm's appetite for hedging using the survey question shown in Table 9.

As shown in Table 9, Panel A on a scale of 1 to 5, 11.6% of respondents said that their firm prefers to "do nothing" to manage foreign currency risk (option 1) whereas 19.6% said they aggressively mitigate "foreign exchange rate volatility" (option 5). Another 24% gave a score of 4 suggesting they are inclined to hedge this risk. In Panel B, we find that public companies tend to be more aggressive in managing this risk than private companies with more than 50% of the public companies scoring a 4 or 5 and only 1% indicate that they do nothing. Of the private companies in panel B, one-third do nothing and only 30% score a 4 or 5. We find a similar trend for large versus small revenue firms. Some of the public-private distinction is correlated with a size effect. It is logical to infer that the information asymmetry for investors that can lead to a demand for risk management is likely wider in public companies. The size effect may also be related to complexity although larger firms often have the advantage of mitigating shocks especially if they have a portfolio of businesses and regions they operate in. The differences in risk management propensity are not as pronounced when we condition the responses on the size of the foreign contribution to a firm's revenue.

7.1 Why hedge foreign currency risk?

GMS use creative empirical tests to identify characteristics of firms that use currency derivatives and show that firms with greater growth opportunities and tighter financial constraints are more likely to use derivatives.³⁴ We ask participants what their primary motivations are for hedging (or not hedging) currency exposures. Hedging is meant to reduce the uncertainty and/or volatility of cash flows and potentially reported measures, so it could be related to transaction or translation exposures (as described in Exhibits 1 and 4). However, there is always a debate about what a hedge means. If there is a clear match of cash inflows and outflows between the underlying transaction and the hedged instrument, the purpose of the hedge is unambiguous. Hence, the survey instrument asks whether the reasons for hedging relate to "economic" hedges with clear time-specific cash flows that ensure a rate for (i) a transaction and/or (ii) for actual cash flows. The other alternatives provided in the motivations for hedging question

³⁴ There is a vast literature on the value of corporate hedging in general (see Smith and Stulz 1985, Froot et al. 1993, DeMarzo and Duffie 1995, Haushalter 2000, and Graham and Rogers 2002 among others). Turning to foreign currency specifically, several studies focus on measuring the extent of currency risk exposure and the effectiveness of such hedging (see Jorion 1990, Bartov and Bodnar 1994, Bartov et al. 1996, Chow et al. 1997, He and Ng 1998, Griffin and Stulz 2001, Allayannis et al. 2001 and Williamson 2001). Unlike our work, these papers rely on stock return derived, as opposed to accounting, measures of currency risk exposure.

relate more to performance measurement and reporting including: (i) reducing volatility of earnings and cash flows; and (ii) facilitating reporting of budgeted results and (iii) reducing the impact on parent performance measures.

Table 10, panel A shows that the most common motivations for hedging currency exposures are primarily to reduce the volatility of cash flows (77.2%) and earnings (77.3%) and ensure the rate for a transaction (76.7%). Hence, both economic hedging and reducing volatility of reported numbers seem to be important motivations for hedging. Interestingly, when we condition the data on firm characteristics in panel B, public firms (78%) are overwhelmingly in favor of hedging to reduce the volatility of earnings relative to private firms (57%). However, that difference is not observed for reducing cash flows. A greater focus on reducing the volatility of reported earnings, as opposed to that of cash flows, is consistent with the evidence reported in Graham, Harvey and Rajgopal (2005). Firms that give earnings guidance are predictably more interested in facilitating the reporting of a budgeted amount (45% vs. 18%). Public companies are more motivated to ensure the rate of the transaction and to reduce volatility of cash flows, again consistent with the possibility that better systems and organizational structures facilitate reporting and hedging.

Table 10, panel B also reports survey evidence on the primary motivations for *not* hedging. The dominant reasons appear to be that the costs of hedging do not justify the benefits (68.0%) and that our firm has sufficient natural hedges (58.7%). However, interviewed CFOs' definition of natural hedges was looser than the strict definition we propose in section 4.1 of the paper. Respondents were also overwhelming against the notion that they do not hedge because their investors understand the exposure (20.0% yes). When we look at the responses conditioned on firm characteristics in panel B, interesting insights emerge. Public firms are overwhelmingly more likely to say that their investors do not understand their exposure relative to private firms (28.6% vs. 63.6%). This finding hints at the possibility that the textbook notion that shareholders can unravel the firms' hedges is suspect.

Specific comments provided interesting anecdotes on the motivations for hedging and not hedging. For example, one respondent said, "the whole goal of hedging is to minimize the impact of FX volatility on the company's performance (e.g. FCF and bottom line EPS)." The most telling comment on why a company did not hedge was: "We are really expense exposed to Euro, Rupee, and Yuan and since the dollar has gained in strength, nobody is asking too many questions, meaning most of our contracts are in USD but 30% of our expenses are in the other currencies. So, we have been experiencing lower costs - nobody is complaining. But they will when things move the other way."

7.2 Accounting standards drive hedging behavior

We encountered several instances where accounting standards appeared to drive firms' hedging actions. For instance, one participant writes, "current hedging is on balance sheet exposures

(intercompany loans). Only loans deemed "current" are hedged. Loans deemed "not current," but not eligible for long-term designation as per ASC 830, Foreign Currency Matters, are not hedged and yield volatility in earnings. Loans eligible per ASC 830 are designated long-term. Forecasted transactions are not yet being hedged on a recurring basis. That is expected to be implemented in 2017."

One treasurer of a large multinational with a sophisticated currency risk management system narrated the case of a \$100 million contract with an oil and gas facility for five years. "in year 4, we wanted to change the supplier, who is Euro based, to a Yen based supplier because the Euro based supplier was delivering an inferior product. Let's assume that the revenue is in USD. If we hedge the Euro exposure on day 1 and the supplier changes, we would miss the cash flow forecast and the company might lose hedge accounting for the entire company."

The treasurer also mentioned that several years ago they had a net income hedging program but the company got into SEC issues related to hedge effectiveness so now they don't use net income hedges like they used to. He mentioned that his CEO would love to hedge net income but they can't do so because under derivative accounting, everything as per the standards has to be done at the transaction level."

7.3 "FAS 133 makes us take more risk"

One treasurer described the situation at his firm as follows, "FAS 133 has counter-intuitively created incentives for our company to take on more risk. He narrated an example where the firm has a multi-year contract to sell product in Euros. The contract is approximately \$5-\$10 billion. If the Euro moves 15%, that can really affect earnings. But if the actual receipts do not occur exactly as expected even by a few days so that the hedge's fair value does not move in lock step, the firm runs the risk of losing hedge accounting for the whole company. Hence, it is almost better to not hedge the Euro exposure."

When asked how they manage this apparent inefficiency whereby they don't hedge economic exposure because of accounting rules, the CFO said that (i) they have been analyzing hedge accounting rules to better manage exposures; (ii) they are trying to mobilize other significant companies to lobby the FASB to change the rules; and (iii) they want to be more transparent via better voluntary disclosure to investors. Along similar lines, several CFOs complained about restrictions on hedging imposed by hedge accounting rules. The following comment was typical: "we also wanted to protect cash flows but we were constrained by hedge accounting. We never wanted to go out of hedge accounting's boundaries and create volatility."

To gather systematic data on this question, we ask the following question, "How do current accounting standards for hedging (e.g. FAS 133 now ASC 815) affect your ability to manage the foreign currency exposure you face?" As shown in Table 11, panel A, 37.5% of surveyed executives claim that

accounting standards constrain their ability to manage their foreign currency exposure. However, in panel B, Table 11, we see that 42.3% (82.8%) of public (private) companies say the accounting standards have no effect with 45.7% (10.3%) saying it does have an effect. Companies with larger (smaller) revenues indicate similar percentages. Also 80.0% of the firms who do not hedge indicate that the accounting standard has no effect.

The hedge effectiveness test of SFAS 133 was meant to ensure that the receivable or payable position on the underlying claim was offset by an approximately equal payable or receivable on the derivative. However, we heard of cases where firms bought a derivative position first to ensure some reporting or economic objective and then ex post looked around in the business to find a set of opposite cash flows to satisfy the hedge effectiveness test. In particular, a foreign currency consultant mentioned, “many of the headquarters buy a net investment hedge first and then ex post figure out what that hedge is hedging to meet the effective hedge test under the accounting standards. A fancier way of doing this is to borrow in Euros given that the interest rates now are tiny. The foreign currency fluctuation in the Euro is then routed to equity and it offsets the currency risk in the equity of the foreign sub. The downside, of course, is that when you unwind this debt 5-10 years from now, we don’t know what will happen to the Euro.”

7.4 Borrowing in a currency other than the functional currency

As seen in Exhibit 5, one way to reduce net investment exposure and to get local managers to recognize the financing cost of its funding in earnings, is to fund in local currency. If such borrowing occurs in the functional currency with a local lender, there is no residual foreign currency exposure (panel C of Exhibit 5). However, if the parent lends the money and does not hedge the exchange rate underlying the lending, then the parent and group will still be exposed to currency risk and in principle to a transaction gain or loss. SFAS 52 allows such loans to be deemed as a long-term investment such that the exchange gain or loss is designated as a translation adjustment in OCI. This gain or loss can be avoided through a hedge (panel D) although it is more difficult to hedge if the loan is long-dated.

Incorporating financing costs in performance measurement (e.g. by using income) induces some managers to believe that by borrowing in a currency with lower interest rates, they will lower the financing cost. The more decentralized the decision-making, the more likely this is to happen at the local level. Prior experience suggests several instances where the local subsidiary in higher rate countries would often borrow in the parent currency at lower interest cost but then incur large translation losses periodically. Such borrowing can also occur at the treasury level and implies that managers do not believe in interest rate parity between the functional and borrowing currency. Hence, we ask “does the foreign subsidiary or centralized treasury borrow funds in *non-functional* currencies if they think the local interest rates are low/cheap?” Interestingly, in Table 12, 41.0% of respondents said “yes.” Hence, in

41% of the sample, savings from low local interest rates might be potentially lost in large transaction losses. When we consider the results conditioned on firm characteristics larger companies answer yes. Moderate hedge propensity firms are also more likely to engage in this practice. A follow up question asked “who decides?” The most common answer was the treasurer suggesting that for most firms at least the controls are in place to prevent local managers from making this decision.

7.5 Difficulty in communicating hedge disclosures to analysts

Motivated by comments about the constraints imposed by hedge accounting, we asked interviewed CFOs whether it is a viable strategy to go out to analysts and tell them that to increase firm value, we have decided to hedge even though we risk losing hedge accounting. One CFO of a large multinational thought that this disclosure strategy was unviable “given the company’s large scale and the “noise” in the market place if there was even a hint that the company was violating accounting standards even if such a violation increased firm value.” He said other companies seem to manage this friction by relying on non-GAAP numbers where they merely add back the foreign currency adjustments.

7.6 Specifics of what is hedged

As we can see from Exhibits 1, 2 and 4, transaction and translation exposures occur in different areas. For example, a sale in the functional currency creates translation exposure in parent currency revenue affecting measures like growth rates and margins which boards and market participants are sensitive to. A sale in a non-functional currency can also lead to transaction exposure in the receivable, which creates both earnings and a real cash exposure for the subsidiary (and potentially the parent). To gather more systematic data on what is hedged in practice, we ask which items CFOs specifically hedge. Table 13 Panel A summarizes the unconditional responses. The three cash exposures were most likely to be hedged: payables (67.0%), specific cash flows (63.7%); and receivables (58.2%). A large minority hedge reported costs (42.2%) and reported revenue (38.0%).

In panel B of Table 13, we show that firms with larger foreign revenue contributions or aggressive hedgers have an even greater likelihood of hedging reported revenue. Private companies are much less likely to hedge reported costs. Given investors’ focus on net income, a third of respondents and 45% of aggressive hedgers indicate they hedge earnings, despite this being unrelated to a specific cash flow unless distributed in the reporting period.

As we see in Exhibit 5, potentially large exposures from retained earnings and capital stock are reflected as cumulative translation adjustments (CTA). The actual cash flow exposure for shareholders will arise when the capital is returned via dividends or repurchases of stock, at which point any CTA will go to earnings. An interviewed CFO articulates our view as follows “if we believe there is any role for hedging, then actual cash flows should be hedged. If the sub hedges capital or retained earnings and does not distribute its capital, the sub implicitly relies on the exchange rate to go in the opposite direction,

failing which the firm is simply delaying the inevitable loss in value. If, on the other hand, the sub returns capital to the shareholders, the sub is effectively guaranteeing the payout to the parent.” A couple of survey takers express similar views: (i) “we will use hedging for scheduled return of capital to US or other cross border payments;” (ii) “we do not hedge the accounting translation of earnings, only when we will move/repatriate actual cash.”

These views suggest that we might expect respondents to hedge dividends to the parent. Yet, as shown in Table 13, only 35.6% indicate in panel A that they do so although the tendency to hedge dividends is higher at 47.9% for those with a large foreign revenue contribution as shown in panel B. On the other hand, despite the potential inefficiency resulting from cash exposures on the expiration of hedges of CTA, 30.9% of all respondents hedge the net investment (CTA) in panel A and this percentage is even higher for public companies (35.6%) and those with large foreign contributions to revenue (37.7%) in panel B.³⁵ One possible explanation for this could be concerns over capital ratios in financial institutions, however we do not have the data to test this.

It is worth noting that receivables, payables, specific cash flows and dividends to the parent can be directly hedged. However, hedging reported revenue, costs, net income, and CTA will reduce reported volatility in these metrics during the period when the hedge is placed but will simultaneously leave a cash flow exposure via the offsetting payable or receivable.

7.7 Hedging to functional currency or reporting currency

One of the complications rarely discussed in the academic and practitioner literatures is that many companies conduct transactions in currencies (e.g., sterling) that are different to the functional currency of a subsidiary (Euro) and the reporting currency of the group (USD). This complication creates the following exposures: (i) when the transaction currency (sterling) is recorded as sale and receivable in the functional currency (Euro); (ii) when the receivable balance is converted to Euros on receipt of cash creating a transaction gain or loss in earnings and (iii) when the functional currency (Euro) revenue and income is translated into the reported values (USD). To better understand whether the firms are focused on the subsidiary functional currency or the parent reporting currency to manage the reporting volatility, we use a hypothetical example allowing for either or both exposures to be hedged.

Specifically, we ask, “Hypothetical scenario: You have a USD parent and a European subsidiary with a Euro functional currency. The European subsidiary has revenue (or costs or net income see above) in sterling of £100,000. Do you hedge the sterling revenue (or costs or net income) to (i) Euros (the functional currency); (ii) USD (the reporting currency); (iii) both; and (iv) don’t know.”

³⁵ Hedging CTA is potentially not wasteful only if the firm hedges CTA for the exact period between the occurrence of the CTA and the return of capital (dividend repatriation) from the subsidiary to the parent.

In terms of a pure cash hedge, we would only expect the sterling to Euro receivable to be hedged and as seen in Table 14, 42.3% of respondents indicate they hedge to the Euro. However, 28.9% indicate they would hedge to the USD reporting currency and 19.2% answer both while 9.6% indicate they do not know. These data suggest that at least 48% of the respondents would enter a hedge for this transaction to the reporting currency despite the absence of a direct economic or cash flow impact associated with this hedge.

7.8 Derivative to favorably alter ratios

In our preliminary interviews, a foreign currency consultant highlighted firms' desire to enter into derivative transactions to alter the ratios presented in the financial statements, "I warn them that the derivative you want, as a client, will force another answer to this ratio problem. But this kind of thinking is unpopular among my clients. There are two kinds of companies. Those that will do what is right for their shareholders and then will explain what they did, however complex, with respect to the hedging and/or the accounting, to the analysts. Then, there is the other category that does not trust the analyst to do smart analysis. They seem to be telling us that the analysts are either lazy or unable to do these ratios. All they do is follow the bottom line." Of course, this concern could simply suggest that analysts do not have access to high quality data on a firm's foreign exchange exposures.

To extract more specific information about firms' propensity to hedge a reported earnings number, we ask the following question, "Hypothetical scenario: Half way through the year your USD translated EPS is up 5% from foreign currency fluctuations (the organic growth is zero). What is the probability that your company will purchase a derivative that will enable you to ensure the 5% growth from currency is sustained through your year-end reported results?" As reported in Table 15, 35.5% of respondents (10.4%+ 14.6%+ 6.3%+ 4.2%) said that there is a 25% or greater chance that they would buy a derivative to hedge the earnings. Furthermore, 25.1% of the total in panel A (14.6% + 6.3% +4.2%) and even higher proportions of companies with larger foreign contributions (29.4%) in panel B said there was at least a 50% probability they would hedge the earnings. We then ask whether the answer would change if they intended to distribute the earnings. The intention behind the follow up question is to address the possibility that the hedge was meant to preserve the cash flow payout, as opposed to preserving reported income. 30.9% indicated the probability would increase and 60% of those were respondents who had answered zero probability to the initial question. The high probabilities assigned to hedging a reported earnings number affirms that managers choose to incur cash flow risks in order to reduce volatility of and/or ensure a level of reported earnings.

7.9 The relation between the translation adjustment in other comprehensive income and earnings

As seen in Exhibit 4, and discussed in section 7.21, in times of volatile exchange rates, companies with significant investments in subsidiaries with functional currencies other than the reporting currency

will record large translation adjustments in OCI on these net investments. If unhedged, these can be large relative to reported earnings. In sections 6.2 we discuss the impact of CTA on performance evaluation and the academic evidence of its pricing by investors. We see further in section 7.22 that managers will hedge exposures to achieve a level of reported earnings. Hence, a question arises as to whether managers will do anything if during the year the CTA in OCI becomes a large portion of income. By doing something, the managers are indicating that they view the CTA as economically relevant.

In particular, we ask, “Hypothetical scenario: During the year, the translation adjustment you report in Other Comprehensive Income (OCI), reflects a loss equivalent to 30% of this year’s expected net income number. What, if anything, do you do in response?” As reported in Table 16, 62% said they would do nothing. 33% of CFOs would take some action to mitigate this loss. 15% of CFOs said they would hedge to limit the reported loss. 12% would adjust the funding source (e.g., local borrowing). In panel B, conditional analyses suggest that larger and public firms are more likely to adjust funding sources. Private firms are more likely to do nothing.

The qualitative text based responses to this hypothetical were instructive. Several CFOs explained why they would hedge translation gains and losses in OCI: (i) “as a policy, we hedge net investment FX exposures contemporaneously with them being recorded on the books (i.e. coming into existence). If perfectly effective, this hedge strategy would be expected to have gains equal and opposite the observed translation losses.” (ii) “ensure effective investor communication;” (iii) “we do borrow in foreign currency which provides a hedge against this sort of translation;” The ones who said that they would not hedge translation gains and losses in OCI stated: (i) “depends on whether we believe entity is an ongoing concern or has the potential to be liquidated at some later date;” (ii) “OCI means hedge accounting - we are not worried about volatility of equity;” (iii) “we don't hedge for translation adjustments. our banks understand this as non-cash accounting, and allow us to adjust it in our covenants.” The last comment is somewhat odd because the creditor (bank) would implicitly then treat a fall in the value of the equity investment in the subsidiary as transitory although there is no explicit evidence to suggest that is indeed the case.

7.10 Other practical issues with hedging

7.11 Bimodal expertise

Several interviewed CFOs highlight a bimodal world where a few large firms are sophisticated in managing foreign currency risk while the vast majority of the rest are not. To quote one foreign exchange consultant working for a Big Four audit firm: “the typical scenario is that some item that is an input is exported from the US to the foreign sub. The sub sells product in Euros. The treasury tries to hedge the cost of imports to the foreign sub. Now, translating the results back into USD is a second whack that a lot of companies are not even ready for. That is a second-generation conversation that many don’t know how

to initiate. The first part is usually handled well by a Fortune 50 company. The second part related to translation is ugly and can be a tough conversation.”

As an example of a sophisticated company, the consultant went on to describe Honeywell’s strategy: “their treasurer has been around for a while and he presented his work at the Euro Finance conference. In 2013/4, they had a view that the USD would strengthen and they were, of course, right, looking back. They got a derivative that would become an asset if USD strengthened. They had a Euro functional sub with some USD transactions such that those USD transactions become a natural hedge. However, the USD transactions were not numerous enough to make them a USD functional sub. So, they got this derivative to somehow unwind the natural hedge. They follow cash flow hedge accounting. Their scheme was such that when USD went up, they recorded a gain on their derivative and the lack of the natural hedge boosted net income. This caused translated NI to become larger in absolute terms and when benchmarked against the previous year. They did this quite aggressively for several years. When I asked what was the plan if the USD weakened, they said they had stop-loss triggers in place which were all supervised and approved. Some of this is disclosed in the letter to shareholders in their 10-K.”

To cite an example of an “unsophisticated” company, the consultant narrated the following anecdote: “we recently worked with an intermediary financial services company. They were the middle man between the customer facing entity and the financier. They earn the spread. Part of the service is to immunize everyone from foreign exchange risk. There is a 30-90 day delay between A and B. But they were not charging for this risk. They got away with this when the USD was weak but now they are in trouble because the USD is getting strong.”

7.12 Disputes in philosophy of what to hedge

A CFO of a global airline suggested that one of the key issues that he is grappling with is the philosophy related to hedging. He states: “some of the board members feel that they are better off not hedging fuel prices given that oil prices are falling. I feel it is better to hedge future fuel needs at this low price so that the company is better positioned to deal with future increases in oil prices.” That is, the CFO feels that these low prices are temporary. He went on to mention that they have hedges at \$55 a barrel although the current oil price is \$39 a barrel. He clarified that a major American airline was not hedged partly because they could not get credit following their bankruptcy. However, they are the best performer this quarter because of falling oil prices. Another major airline has suffered a \$2 billion loss in hedging. This CFO is asking his board to approve purchase of oil five years forward at these low prices today as he believes oil prices will rise in the future. However, the board seems to have adopted a view that the future price of oil will likely fall some more.

7.13 Over and under hedging

We came across several examples where firms admitted to over and under hedging. Here is an example from a CFO of a global airline, “we have a JV with another airline. The flows from the JV come in dollars and hence provide a natural hedge to the dollar outflows for fuel. So, now we have to hedge 20% less but that took us close to a year to realize. We were over hedging for a while partly because the JV agreement was very complicated.”

7.14 “Hedging merely buys you time”

An interviewed CEO highlighted the importance of potentially changing the firm’s business model if currency changes persist for a while: “consider short term and long term program costs. We often looked at things year to year and had an outlook of three years. More than one year, you may have to change your business to deal with currency fluctuations. Hedging merely buys you some time. If there is an underlying multi-year trend, you have to change your fundamental business. In the short term we hedged. In the long term decisions about sourcing and pricing have to be made. The planning and the pricing people have to then get involved. If there were long term trends in the USD, then we would have debates as to whether we were getting killed by currency. In the near term, it’s a gut call.” This comment also highlights the need for performance evaluation systems to incorporate the impact of currency in the local managers’ compensation plans at least in the medium or long run.

7.15 Who is responsible for the hedging program?

The current practice is to have the central treasury function decide on what item is specifically hedged. The strategy related to hedging is decided at a CFO or higher level. However, local managers often feel the stress of currency volatility and believe they have local insight. Hence, there have been cases in the past where local managers enact independent hedges on their own. Such local effort may seem inefficient from a consolidated perspective as local hedges potentially ignore offsetting positions at the firm/entity level. Yet if all the decisions are made at the consolidated level, a consequent question relates to how that hedge is passed down to the subsidiary. To shed light on existing practice, we ask who is responsible for the hedge strategy-local management or a centralized treasury function. Un-tabulated results suggest that the Corporate Treasurer (65%) and/or the CFO (58%) are usually responsible. Interestingly, 16% of the respondents said that local or divisional management ran the hedging program.

7.16 Lack of coordination between tax, treasury and controllers

A foreign exchange consultant we interviewed highlighted disconnects between the tax emphasis and the book emphasis, which could be different from the economics of the hedge. He elaborated, “treasury feels good about the hedge but then the foreign tax guy comes and whacks you. Tax did not even know what the Treasury was doing. So, the tax director gets a bad performance review because the tax aspects of the hedge have not been considered. In one case, the Treasury guys did not know that losses on net investment hedges are not deductible for tax purposes. So, this transaction was great for

book but terrible for tax. A CFO needs to coordinate these three departments (tax, controller and treasury) before he can decide what to do about the USD strengthening.”

8. Conclusions

We conduct a comprehensive survey to understand how managers account for, report, budget for, compensate and reduce exposure to foreign currency in their businesses. We document several practices that are inconsistent with theory and with one another. A construct as basic as “cash balance” and free cash flows is fraught with measurement error when the firm has an international subsidiary. Standard performance measures such as ROA, ROE, RNOA, asset turns and so on can be materially different depending on the choice of the functional currency of the subsidiary and the exact practices used to remeasure and/or translate the subsidiary’s operations to dollars or the reporting currency, in general. Remarkably, around 80% of senior managers and board members only review USD based cash flows and hence overlook such measurement problems. These results suggest that users of financial statements, such as investors and analysts, at the very least, do not have access to the information they need to understand the contribution of potentially unsustainable foreign currency gains and losses to reported net income. Hence, the textbook notion that investors can unravel manager’s hedging on their own is suspect.

When we look at how currency exposures are managed inside the firm, interesting insights emerge. Most firms use a budgeted exchange rate for the subsidiary that is predominantly set by a centralized treasury function or the CFO. Sometimes these budgeted rates are based on currency rates that are unrealistic in that centralized treasury would not invest the company’s funds on the basis of such rates. However, local managers are expected to manage their affairs to conform to such budgeted rates. More than half the CFOs in the survey suggested that neither senior managers nor the local managers are held responsible for transaction and translation gains and losses at the firm. However, these losses are “real” in the sense that shareholder value falls once they are incurred. Cumulative translation adjustments (CTA), which implicitly represents the funding cost associated with leaving the net investment of the subsidiary exposed to the functional currency, is also overlooked while compensating senior and local managers in more than half of the cases surveyed. We find several instances where surveyed managers would purchase a derivative or hedge reporting exposures, as opposed to purely economic exposures: (i) 78% of public firms say they would hedge to reduce volatility of reported earnings relative to 57% of private firms; (ii) 47% of surveyed CFOs would hedge a third currency exposure to the reporting currency rather than or in addition to hedging to the subsidiary’s functional currency; and (iii) 35% of managers would buy a derivative to report earnings growth via an earlier currency gain. About a third of the surveyed managers claim that accounting standards constrain their ability to hedge economic exposures.

Our intent was to highlight the nuance and detail that is inherently associated with the reporting, measurement and management of currency exposures in firms. In our experience, students, academics and practitioners often under-emphasize currency gains and losses partly because the underlying measurement is complex and not well understood. We hope our paper has managed to unravel some of this complexity and point out many inconsistencies among practitioners and relative to reflecting underlying economic reality.

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Exhibit 1: Example of Translation Impact on Cash Flow Information

Panel A: Data in Euro-based Operating Entity

Date	Description	Cash	Receivables	Inventory	Intangibles		PP&E		Payables	Debt	Capital Stock	Retained Earnings
					Cost	Accumulated Amortization	Cost	Accumulated Depreciation				
1/1/2016	Beginning Balance	6,000	10,000	8,000	48,000	(9,600)	80,000	(32,000)	7,000	50,000	50,000	3,400
Q1-2016	Purchases			24,000					24,000			
Q1-2016	Sales		50,000									50,000
Q1-2016	Cost of Sales			(21,000)								(21,000)
Q1-2016	SG&A	(3,400)										(3,400)
2/1/2016	Receipts from Customers	30,000	(30,000)									
3/1/2016	Receipts from Customers	20,000	(20,000)									
2/1/2016	Payments to Suppliers	(12,000)							(12,000)			
3/1/2016	Payments to Suppliers	(11,000)							(11,000)			
3/28/2016	Debt issuance	10,000								10,000		
3/28/2016	Capital Expenditure	(10,000)					10,000					
Q1-2016	Depreciation							(2,000)				(2,000)
Q1-2016	Amortization					(1,200)						(1,200)
3/31/2016	Interest	(1,000)										(1,000)
3/31/2016	Taxes	(6,400)										(6,400)
3/31/2016	Dividend paid	(18,000)										(18,000)
3/31/2016	Ending Balance	4,200	10,000	11,000	48,000	(10,800)	90,000	(34,000)	8,000	60,000	50,000	400
	Sum of Euro Cash Flows for the Quarter	(1,800)										
	Change in Euro Cash Balances	(1,800)										
	Free Cash Flow											
	EBIT	22,400										
	Depreciation and Amortization	3,200										
	Capital Expenditure	(10,000)										
	Change in Working Capital	(2,000)										
	<i>Free Cash Flow</i>	<u>13,600</u>										
	FCF in USD at average rate	14,994										
	FCF in USD at year end rate	15,397										

Exhibit 1, Panel B: Euro Data Translated at Rates Typically Used in Cash Flow Statements (average rates for income statement, debt, capex and dividends at rates when they occur)

Date	Description	Cash	Receivables	Inventory	Intangibles		PP&E		Payables	Debt	Capital Stock	Retained Earnings	Exchange Rates
					Cost	Accumulated Amortization	Cost	Accumulated Depreciation					
1/1/2016	Beginning Balance	6,515	10,858	8,686	52,118	(10,424)	86,864	(34,746)	7,601	54,290	54,290	3,692	1.086
Q1-2016	Purchases			26,460					26,460				1.103
Q1-2016	Sales		55,125									55,125	1.103
Q1-2016	Cost of Sales			(23,153)								(23,153)	1.103
Q1-2016	SG&A	(3,749)										(3,749)	1.103
2/1/2016	Receipts from Customers	33,075	(33,075)										1.103
3/1/2016	Receipts from Customers	22,050	(22,050)										1.103
2/1/2016	Payments to Suppliers	(13,230)							(13,230)				1.103
3/1/2016	Payments to Suppliers	(12,128)							(12,128)				1.103
3/28/2016	Debt issuance	11,165								11,165			1.117
3/28/2016	Capital Expenditure	(11,165)					11,165						1.117
Q1-2016	Depreciation							(2,205)				(2,205)	1.103
Q1-2016	Amortization					(1,323)						(1,323)	1.103
3/31/2016	Interest	(1,103)										(1,103)	1.103
3/31/2016	Taxes	(7,056)										(7,056)	1.103
3/31/2016	Dividend paid	(20,378)										(20,378)	1.132
3/31/2016	Calculated Ending Balance	3,998	10,858	11,994	52,118	(11,747)	98,029	(36,951)	8,703	65,455	54,290	(149)	calculated
3/31/2016	Translated Ending Balance	4,755	11,321	12,453	54,341	(12,227)	101,889	(38,491)	9,057	67,926	56,605	453	1.132
	Difference in Translated vs Calculated Ending Balances	757	463	459	2,222	(480)	3,860	(1,541)	354	2,471	2,315	601	
	Sum of Translated Cash Flows for the Quarter	(2,517)											
	Change in Translated Cash Balances	(1,760)											
	Translation of Euro Cash Flow at average rate	(1,985)											
	Free Cash Flow												
	EBIT	24,696											
	Depreciation and Amortization	3,528											Using average exchange rate
	Capital Expenditure	(11,165)											Using period specific exchange rates
	Change in Working Capital	(2,774)											Using period end rates for Euro balances
	<i>Free Cash Flow</i>	14,286											
	<i>Translated Euro Free Cash Flow at average rate</i>	14,994											

Exhibit 1, Panel C: Euro Data Translated Using Date-Specific Rates for Receipts and Payments and Averages for Remaining Revenue and Costs (highlighted rates in panel C last column labeled “exchange rates” differ from those in the last column of panel B)

Date	Description	Cash	Receivables	Inventory	Intangibles		PP&E		Payables	Debt	Capital Stock	Retained Earnings	Exchange Rates
					Cost	Accumulated Amortization	Cost	Accumulated Depreciation					
1/1/2016	Beginning Balance	6,515	10,858	8,686	52,118	(10,424)	86,864	(34,746)	7,601	54,290	54,290	3,692	1.086
Q1-2016	Purchases			26,460					26,460				1.103
Q1-2016	Sales		55,125									55,125	1.103
Q1-2016	Cost of Sales			(23,153)								(23,153)	1.103
Q1-2016	SG&A	(3,749)										(3,749)	1.103
2/1/2016	Receipts from Customers	32,493	(32,493)										1.083
3/1/2016	Receipts from Customers	21,726	(21,726)										1.086
2/1/2016	Payments to Suppliers	(12,997)							(12,997)				1.083
3/1/2016	Payments to Suppliers	(11,949)							(11,949)				1.086
3/28/2016	Debt issuance	11,165								11,165			1.117
3/28/2016	Capital Expenditure	(11,165)					11,165						1.117
Q1-2016	Depreciation	-						(2,205)				(2,205)	1.103
Q1-2016	Amortization	-				(1,323)						(1,323)	1.103
3/31/2016	Interest	(1,132)										(1,132)	1.132
3/31/2016	Taxes	(7,245)										(7,245)	1.132
3/31/2016	Dividend paid	(20,378)										(20,378)	1.132
3/31/2016	Ending Balance	3,283	11,764	11,994	52,118	(11,747)	98,029	(36,951)	9,114	65,455	54,290	(368)	calculated
3/31/2016	Translated Ending Balance	4,755	11,321	12,453	54,341	(12,227)	101,889	(38,491)	9,057	67,926	56,605	453	1.132
	Difference in Translated vs Calculated Ending Balances	1,471	(443)	459	2,222	(480)	3,860	(1,541)	(57)	2,471	2,315	820	
	Sum of Translated Cash Flows for the Quarter	(3,231)											
	Change in Translated Cash Balances	(1,760)											
	Free Cash Flow												
	EBIT	24,696											
	Depreciation and Amortization	3,528	Using average exchange rate										
	Capital Expenditure	(11,165)											
	Change in Working Capital	(2,700)	Using balances from translated accounts										
	<i>Free Cash Flow</i>	14,359											
	<i>Translated Euro Free Cash Flow at average rate</i>	14,994											

Exhibit 1, Panel D: Impact of Euro based data in panel A and USD data in panel B and C on various profitability ratios

Example of the impact on Key Profitability Ratios			
	Euros	USD-B	USD-C
RNOA	41.7%	61.3%	61.3%
ROE	98.5%	97.7%	96.4%
DSO	18.0	18.5	18.5
Inventory Turnover	7.64	7.44	7.72
DPO	35.4	35.2	35.2

Exhibit 2: Example of the Impact of Currency Translation on Add back of Depreciation in Indirect Cash Flow Statements

Period	Rate Basis	\$:Euro	Euro - Actual		USD - Translated	
			Amounts	Difference	Amounts	Exchange Difference
When rates used are consistent in the income statement and cash flow statement						
Q1 2015	Average	1.125	Earnings Before Depreciation in Income Statement	15,000		16,875
	Average	1.125	Depreciation in Earnings	(2,000)		(2,250)
	Average	1.125	Net Income	13,000		14,625
	Average	1.125	Depreciation in Cash Flow Statement	2,000	0	2,250
	Average	1.125	Earnings Before Depreciation in Cash Flow Statement	15,000	0	16,875
When rates used are INconsistent in the income statement and cash flow statement						
Q1 2015	Average	1.125	Earnings Before Depreciation in Income Statement	15,000		16,875
	Average	1.125	Depreciation in Earnings	(2,000)		(2,250)
	Average	1.125	Net Income	13,000		14,625
	Quarter End	1.082	Depreciation in Cash Flow Statement	2,000	0	2,164
	Blend		Earnings Before Depreciation in Cash Flow Statement	15,000	0	16,789

Exhibit 3: Example of the Impact of Currency on Reported Cash Flows with Transactions in the Period

Date	\$:Euro		Euro - Actual		USD -Translated		Exchange Difference
			Amounts	Changes	Amounts	Changes	
12/31/2014	1.217	Period End Balance	10,000		12,170		
2/1/2015	1.129	Receipt from Customer	(10,000)	(10,000)	(11,290)	(11,290)	
		exchange difference from month end balance			(880)		(880)
3/16/2015	1.050	Receivable from Sales	10,000	10,000	10,500	10,500	
		exchange difference on translation of receipt vs new receivable				(790)	(790)
		exchange difference on month end translation			320		320
3/31/2015	1.082	Period End Balance	10,000	-	10,820		(1,350)

Exhibit 4: Analysis that Demonstrates Transaction Exposures and a few Translation Impacts

Note	Date	Description	BALANCE SHEET					INCOME STATEMENT					
			Cash	Receivables		Inventory	Payables		Net Income	Revenue	Expenses	Exchange	Exchange
			€	€	USD	€	€	USD	€	€	€	Gain/(Loss) €	Rates
A	12/7/2014	Underlying purchase in USD					€ 9,000	\$11,065					1.229
B	12/17/2014	Underlying sale in USD		€ 10,000	\$12,500								1.250
C1	12/31/2014	Exchange Gain/Loss at period end		€ 269			€ 89				€ 179		1.217
D	12/31/2014	Ending Balances	€ 20,000	€ 10,269	\$12,500	€ 8,500	€ 9,089	\$11,065	€ 179		€ 179		
E	1/7/2015	Payment of cash for 2014 purchases	(€ 9,271)				(€ 9,089)	(\$11,065)			(€ 182)		1.193
F	1/10/2015	Purchase goods in USD				€ 11,000	€ 11,000	\$13,010					1.183
G	1/12/2015	Purchase goods services in Euro				€ 15,000	€ 15,000						
H	1/17/2015	Receipt of cash from 2014 sales	€ 10,854	(€ 10,269)	(\$12,500)						€ 585		1.152
I	1/18/2015	Sales to Euro customer		€ 35,000						€ 35,000			
J	1/18/2015	Cost of Goods Sold				(€ 16,800)				(€ 16,800)			
K	1/22/2015	Sales to USD customer		€ 10,780	\$12,500					€ 10,780			1.160
J	1/22/2015	Cost of Goods Sold				(€ 5,400)				(€ 5,400)			
L	1/31/2015	Payments of Local Salaries and other costs	(€ 18,000)							(€ 18,000)			
C2	1/31/2015	Exchange Gain/Loss at month end		€ 289			€ 520				(€ 231)		1.129
M	1/31/2015	Month End Balances	€ 3,582	€ 46,069	\$12,500	€ 12,300	€ 26,520	\$13,010	€ 5,931	€ 45,780	(€ 40,200)	€ 351	
N	Q1 2015	Translation of Income at Qtr Avge Rates								\$51,502	(\$45,225)	\$395	1.125
O		Reported (Translated) Value of USD Sales			\$12,127								
P		Additional Exposure if Same Balances of USD payables and receivables at Qtr End		€ 481			€ 500						1.082
Q		Translation Adjustment on Retained Earnings through Quarter End							(€ 279)				

Exhibit 5: Impact of Different Funding Choices and Implications on Translation Adjustments and Profitability

Panel A: All Equity Financing

	Subsidiary		Parent		Subsidiary		Parent		Adjusting		Exchange Rates	US\$:Euro
	Euros		US \$		Euros		US \$		Entry	Group		
	1/1/2014	1/1/2014	12/31/2014	12/31/2014	12/31/2014	12/31/2014	12/31/2014	12/31/2014	US \$	US \$		
Operating Assets	€ 100,000	\$31,950	€ 121,000	\$147,293	\$38,950				\$186,243		1/1/2014	1.3805
Investment in Sub		\$138,050			\$138,050			(\$138,050)	\$0		Average 2014	1.3287
Loan to Subsidiary									\$0		12/31/2014	1.2173
Total Assets	€ 100,000	\$170,000	€ 121,000	\$147,293	\$177,000			(\$138,050)	\$186,243			
Debt	€ 0										US\$ Interest rate	3.0%
Retained Earnings	€ 0	\$80,000	€ 21,000	\$27,903	\$87,000				\$114,903		Euro Interest rate	4.5%
Translation adjustment	€ 0			(\$2,339)				(\$16,320)	(\$18,659)			
Common Stock	€ 100,000	\$90,000	€ 100,000	\$121,730	\$90,000			(\$121,730)	\$90,000			
Total Liabilities and Equity	€ 100,000	\$170,000	€ 121,000	\$147,293	\$177,000			(\$138,050)	\$186,243			
ROE excl. Translation Adjustment			19.0%	17.6%	4.7%				19.6%			
ROE incl. Translation Adjustment									9.1%			
Earning Before Interest			€ 30,000	\$39,861	\$10,000				\$49,861			
Interest									\$0			
Tax			(€ 9,000)	(\$11,958)	(\$3,000)				(\$14,958)			
Dividends Received									\$0			
Net Income			€ 21,000	\$27,903	\$7,000			\$0	\$34,903			
Dividends Paid			€ 0	\$0	\$0			\$0	\$0			
Earnings ex Dividend			€ 21,000	\$27,903	\$7,000			\$0	\$34,903			
Translated Retained Earnings				\$25,563								
Translation Adjustment on Retained Earnings				(\$2,339)								
Translation Adjustment on Capital Stock				(\$16,320)								
Total Translation Adjustment				(\$18,659)								

Panel B: Mostly Local Currency Third Party Debt Financing – No Dividend

	Subsidiary		Parent		Adjusting		Group
	Euros	US \$	Euros	US \$	US \$	US \$	
	1/1/2014	1/1/2014	12/31/2014	12/31/2014	12/31/2014	12/31/2014	
Operating Assets	€ 100,000	\$169,999	€ 117,850	\$143,459	\$176,999		\$320,457
Investment in Sub		\$1.4			\$1	(\$1)	\$0
Loan to Subsidiary					\$0	\$0	\$0
Total Assets	€ 100,000	\$170,000	€ 117,850	\$143,459	\$177,000	(\$1)	\$320,457
Debt	€ 99,999		€ 99,999	\$121,729			\$121,729
Retained Earnings	€ 0	\$80,000	€ 17,850	\$23,717	\$87,000		\$110,717
Translation adjustment	€ 0			(\$1,988)		(\$0)	(\$1,989)
Common Stock	€ 1	\$90,000	€ 1	\$1	\$90,000	(\$1)	\$90,000
Total Liabilities and Equity	€ 100,000	\$170,000	€ 117,850	\$143,459	\$177,000	(\$1)	\$320,457
ROE excl. Translation Adjustment			200.0%	24.7%	7.2%		16.7%
ROE incl. Translation Adjustment							15.6%
Earning Before Interest			€ 30,000	\$39,861	\$10,000		\$49,861
Interest received (paid)			(€ 4,500)	(\$5,979)	\$0		(\$5,979)
Tax			(€ 7,650)	(\$10,165)	(\$3,000)		(\$13,165)
Dividends received						\$0	\$0
Net Income			€ 17,850	\$23,717	\$7,000	\$0	\$30,717
Dividends paid			€ 0	\$0	\$0	\$0	\$0
Earnings ex Dividend			€ 17,850	\$23,717	\$7,000	\$0	\$30,717
Translated Retained Earnings				\$21,729			
Translation Adjustment on Retained Earnings				(\$1,988)			
Translation Adjustment on Capital Stock				(\$0.2)			
Total Translation Adjustment				(\$1,989)			

Panel C: Mostly Local Currency Third Party Debt Financing – with Dividend

	Subsidiary		Parent		Adjusting		Group
	Euros	US \$	Euros	US \$	US \$	US \$	
	1/1/2014	1/1/2014	12/31/2014	12/31/2014	12/31/2014	12/31/2014	
Operating Assets	€ 100,000	\$169,999	€ 100,000	\$121,730	\$200,716		\$322,446
Investment in Sub		\$1.4			\$1	(\$1)	\$0
Loan to Subsidiary					\$0	\$0	\$0
Total Assets	€ 100,000	\$170,000	€ 100,000	\$121,730	\$200,717	(\$1)	\$322,446
Debt	€ 99,999		€ 99,999	\$121,729			\$121,729
Retained Earnings	€ 0	\$80,000	€ 0	\$0	\$110,717		\$110,717
Translation adjustment	€ 0			\$0		(\$0)	(\$0)
Common Stock	€ 1	\$90,000	€ 1	\$1	\$90,000	(\$1)	\$90,000
Total Liabilities and Equity	€ 100,000	\$170,000	€ 100,000	\$121,730	\$200,717	(\$1)	\$322,446
ROE excl. Translation Adjustment			1785003.2%	27.9%	30.6%		29.4%
ROE incl. Translation Adjustment							29.4%
Earning Before Interest			€ 30,000	\$39,861	\$10,000		\$49,861
Interest received (paid)			(€ 4,500)	(\$5,979)	\$0		(\$5,979)
Tax			(€ 7,650)	(\$10,165)	(\$3,000)		(\$13,165)
Dividends received					\$23,717	(\$23,717)	\$0
Net Income			€ 17,850	\$23,717	\$30,717	(\$23,717)	\$30,717
Dividends (paid)			(€ 17,850)	(\$23,717)	\$0	\$23,717	\$0
Earnings ex Dividend			€ 0	\$0	\$30,717	\$0	\$30,717
Translated Retained Earnings				\$0			
Translation Adjustment on Retained Earnings				\$0			
Translation Adjustment on Capital Stock				(\$0.2)			
Total Translation Adjustment				(\$0)			

Panel D: Mostly Local Currency Debt Financing from Parent with Hedge– no Dividend

	Subsidiary		Parent		Adjusting		Group
	Euros	US \$	Euros	US \$	US \$	US \$	US \$
	1/1/2014	1/1/2014	12/31/2014	12/31/2014	12/31/2014	12/31/2014	12/31/2014
Operating Assets	€ 100,000	\$31,950	€ 117,850	\$143,459	\$57,474		\$200,932
Investment in Sub		\$1.4			\$1	(\$1)	\$0
Loan to Subsidiary		\$138,049			\$121,729	(\$121,729)	\$0
Total Assets	€ 100,000	\$170,000	€ 117,850	\$143,459	\$179,204	(\$121,730)	\$200,932
Debt	€ 99,999		€ 99,999	\$121,729		(\$121,729)	\$0
Retained Earnings	€ 0	\$80,000	€ 17,850	\$23,717	\$89,204		\$112,921
Translation adjustment	€ 0			(\$1,988)		(\$0)	(\$1,989)
Common Stock	€ 1	\$90,000	€ 1	\$1	\$90,000	(\$1)	\$90,000
Total Liabilities and Equity	€ 100,000	\$170,000	€ 117,850	\$143,459	\$179,204	(\$121,730)	\$200,932
ROE excl. Translation Adjustment			200.0%	24.7%	9.3%		17.8%
ROE incl. Translation Adjustment							16.7%
Earning Before Interest			€ 30,000	\$39,861	\$10,000		\$49,861
Interest received (paid)			(€ 4,500)	(\$5,979)	\$5,979	\$0	\$0
Exchange gain/(loss) on loan					(\$16,320)		(\$16,320)
Exchange gain/(loss) on hedge					\$16,320		\$16,320
Cost of hedge					(\$1,982)		(\$1,982)
Tax			(€ 7,650)	(\$10,165)	(\$4,794)		(\$14,958)
Dividends received						\$0	\$0
Net Income			€ 17,850	\$23,717	\$9,204		\$32,921
Dividends paid			€ 0	\$0	\$0	\$0	\$0
Earnings ex Dividend			€ 17,850	\$23,717	\$9,204	\$0	\$32,921
Translated Retained Earnings				\$21,729			
Translation Adjustment on Retained Earnings				(\$1,988)			
Translation Adjustment on Capital Stock				(\$0.2)			
Total Translation Adjustment				(\$1,989)			

Panel E: Mostly Local Currency Debt Financing from Parent with hedge– with Dividend

	Subsidiary		Parent		Adjusting		Group
	Euros	US \$	Euros	US \$	US \$	US \$	
	1/1/2014	1/1/2014	12/31/2014	12/31/2014	12/31/2014	12/31/2014	
Operating Assets	€ 100,000	\$31,950	€ 100,000	\$121,730	\$81,191		\$202,921
Investment in Sub		\$1.4			\$1	(\$1)	\$0
Loan to Subsidiary		\$138,049			\$121,729	(\$121,729)	\$0
Total Assets	€ 100,000	\$170,000	€ 100,000	\$121,730	\$202,921	(\$121,730)	\$202,921
Debt	€ 99,999		€ 99,999	\$121,729		(\$121,729)	\$0
Retained Earnings	€ 0	\$80,000	€ 0	\$0	\$112,921		\$112,921
Translation adjustment	€ 0			\$0		(\$0)	(\$0)
Common Stock	€ 1	\$90,000	€ 1	\$1	\$90,000	(\$1)	\$90,000
Total Liabilities and Equity	€ 100,000	\$170,000	€ 100,000	\$121,730	\$202,921	(\$121,730)	\$202,921
ROE excl. Translation Adjustment			1785003.2%	27.9%	32.4%		30.4%
ROE incl. Translation Adjustment							30.4%
Earning Before Interest			€ 30,000	\$39,861	\$10,000		\$49,861
Interest received (paid)			(€ 4,500)	(\$5,979)	\$5,979	\$0	\$0
Exchange gain/(loss) on loan					(\$16,320)		(\$16,320)
Exchange gain/(loss) on hedge					\$16,320		\$16,320
Cost of hedge					(\$1,982)		(\$1,982)
Tax			(€ 7,650)	(\$10,165)	(\$4,794)		(\$14,958)
Dividends received					\$23,717	(\$23,717)	\$0
Net Income			€ 17,850	\$23,717	\$32,921	(\$23,717)	\$32,921
Dividends paid			(€ 17,850)	(\$23,717)	\$0	\$23,717	\$0
Earnings ex Dividend			€ 0	\$0	\$32,921	\$0	\$32,921
Translated Retained Earnings				\$0			
Translation Adjustment on Retained Earnings				\$0			
Translation Adjustment on Capital Stock				(\$0.2)			
Total Translation Adjustment				(\$0)			

Note: Assumes no tax on dividends

Table 1. Descriptive statistics

Panel A: Summary of aggregate response rates

	Surveyed	Response Rate
Public Companies	1,031	
Private Companies	738	
Total Surveyed	1,769	
Total Responses	207	11.7%
Complete	94	45.4%
Partial	74	35.7%
Total qualified	168	81.2%
Disqualified	39	18.8%
Total Responses	207	100.0%

Panel B: Summary of response rates by company type

Public vs. Private	Responses	% of Responses	% of Segment
NYSE	69	47.3%	6.7%
Nasdaq/Amex	14	9.6%	1.4%
Non-US Exchange	9	6.2%	0.9%
Total Public	92	63.0%	8.9%
Private	54	37.0%	7.3%
Total Answered	146	100.0%	86.9%
Unanswered	22		13.1%
Total qualified	168		100.0%

Panel C: Revenue of respondents

Company Revenues	Responses	% of Responses
<\$100 million	29	20.7%
\$100-499 million	14	10.0%
\$500-999 million	11	7.9%
\$1-4.9 billion	24	17.1%
>\$5 billion	62	44.3%
Total Answered	140	100.0%

Panel D: Proportions of revenue from foreign subsidiaries

% of Revenue from Foreign Subsidiaries	Responses	% of Responses
1-10%	34	24.1%
11-20%	16	11.3%
21-30%	23	16.3%
31-40%	11	7.8%
>40%	57	40.4%
Total Answered	141	100.0%

Panel E: Industry classification of respondents

Industry classification	Responses	% of Responses
Retail & Wholesale	20	11.8%
Mining, Construction	5	3.0%
Technology	19	11.2%
Communication /Media	12	7.1%
Bank/Financial/Insurance	24	14.2%
Manufacturing	38	22.5%
Consulting/Service	10	5.9%
Healthcare	16	9.5%
Energy/Materials	11	6.5%
Transportation	6	3.6%
Other	8	4.7%
Total Answered	169	100.0%

Panel F: Representativeness of surveyed public firms

Revenue	Surveyed Public Firms (n=91)	2016 Compustat Public Firms (n=7168)
Less than \$100 million	26.37%	37.70%
\$100-\$499 million	7.69%	21.48%
\$500-\$999 million	9.89%	9.89%
\$1-\$4.9 billion	19.78%	18.64%
More than \$5 billion	36.26%	12.29%

Debt to Asset	Surveyed Public Firms (n=46)	2016 Compustat Public Firms (n=5353)
0 - 0.19	30.43%	51.52%
0.2 - 0.39	23.91%	23.33%
0.4 - 0.59	19.57%	15.11%
0.6 - 0.79	15.22%	5.53%
> 0.8	10.87%	4.50%

P/E	Surveyed Public Firms (n=40)	2016 Compustat Public Firms (n=10298)
<0	2.50%	42.08%
0 ~ 9	10.00%	7.41%
10 ~ 19	47.50%	20.07%
20 ~ 29	27.50%	14.79%
30 ~ 39	10.00%	5.02%
>40	2.50%	10.63%

Table 2: Data on exchange rate used to add back depreciation in the cash flow statement

Panel A: Unconditional survey responses

For local currency as functional currency subsidiaries, what rate do you use for add back of depreciation in the operating cash flow statement?					
Obs.	Year-end rate (as used for net PP&E)	Average rate used in I/S	Average rate used for OCF (if different from I/S rate)	Rate on date equipment acquired	Don't know
79	8.86%	44.30%	2.53%	6.33%	37.97%

Panel B: Conditional survey responses

For local currency as functional currency subsidiaries, what rate do you use for add back of depreciation in the operating cash flow statement?

	Public vs. Private		Foreign Contribution				Revenue		Guidance		Hedge Aggressiveness			N/M	M/A		
	Public	Private	High	Med	Low	H/M	M/L	H/L	High	Low	Yes	No	Do Nothing			Middle	Aggressive
Year-end rate	5.26%	18.18% *	4.76%	20.00%	0.00%	*	*		7.27%	13.04%	9.26%	8.33%	0.00%	9.09%	11.11%		
Average rate used in I/S	50.88%	27.27% *	42.86%	50.00%	43.75%				45.45%	39.13%	46.30%	41.67%	37.50%	48.48%	41.67%		
Average rate used for OCF	3.51%	0.00%	2.38%	5.00%	0.00%				1.82%	4.35%	1.85%	4.17%	0.00%	3.03%	2.78%		
Rate on date equipment acquired	3.51%	13.64%	4.76%	0.00%	18.75%	**	*		5.45%	8.70%	1.85%	16.67% **	25.00%	0.00%	8.33%	***	*
Don't know	36.84%	40.91%	45.24%	25.00%	37.50%				40.00%	34.78%	40.74%	29.17%	37.50%	39.39%	36.11%		
n	57	22	42	20	16				55	23	54	24	8	33	36		

Note: Z-tests for comparing two proportions are used, *** p<0.01, ** p<0.05, * p<0.1

Table 3: Data on exchange rate used to reflect several items in the cash flow statement

Panel A: Unconditional survey responses

Which of the following exchange rates do you use for changes in balance sheet components reported in the cash flow statement?

	Obs.	Same rate as translated B/S measures	Same rate as income measures (an average)	Rates on specific dates of changes in items	Average rate used for cash flow (if different from I/S rate)	Don't know
Change in working capital items	80	57.50%	7.50%	6.25%	5%	23.75%
Capital expenditures	78	50.00%	12.82%	7.69%	7.69%	21.79%
Debt issuance/payment	77	50.65%	7.79%	11.69%	6.49%	23.38%
Capital issuance/purchase	74	47.30%	8.11%	12.16%	2.70%	29.73%

Note: Z-tests for comparing two proportions are used, *** p<0.01, ** p<0.05, * p<0.1

Table 4: Data on whether senior executives and the board only see USD cash flows?

Panel A: Unconditional survey responses

Non-USD subsidiaries have local currency cash flows which are translated and incorporated into USD consolidated cash flows				
	Obs.	Yes	No	Don't know
Does your senior management see only USD cash flows?	83	78.31%	20.48%	1.20%
Does your Board of Directors see only USD cash flows?	82	85.37%	13.41%	1.22%

Panel B: Unconditional survey responses

Non-USD subsidiaries have local currency cash flows which are translated and incorporated into USD consolidated cash flows															
		Public vs. Private		Foreign Contribution			Revenue		Guidance		Hedge Aggressiveness				
		Public	Private	High	Med	Low	H/L	M/L	High	Low	Yes	No	Do Nothing	Middle	Aggressive
Does your senior management see only USD cash flows?	Yes	75.00%	90.91%	75.61%	75.00%	95.00%	*	*	80.36%	75.00%	76.79%	84.00%	100.00%	75.00%	75.00%
	No	23.33%	9.09%	21.95%	25.00%	5.00%		*	17.86%	25.00%	21.43%	16.00%	0.00%	25.00%	22.22%
	Don't know	1.67%	0.00%	2.44%	0.00%	0.00%			1.79%	0.00%	1.79%	0.00%	0.00%	0.00%	2.78%
n		60	22	41	20	20			56	24	56	25	8	36	36
Does your Board of Directors see only USD cash flows?	Yes	81.67%	95.24%	78.05%	90.00%	94.74%			87.50%	78.26%	85.71%	83.33%	100.00%	86.11%	80.56%
	No	16.67%	4.76%	19.51%	10.00%	5.26%			10.71%	21.74%	12.50%	16.67%	0.00%	13.89%	16.67%
	Don't know	1.67%	0.00%	2.44%	0.00%	0.00%			1.79%	0.00%	1.79%	0.00%	0.00%	0.00%	2.78%
n		60	21	41	20	19			56	23	56	24	7	36	36

Note: Z-tests for comparing two proportions are used, *** p<0.01, ** p<0.05, * p<0.1

Table 5: Data on how senior executives view foreign currency cash balances

Panel A: Hypothetical example

Consider a subsidiary that operates in Europe with Euro as the Functional Currency. There are four standard alternatives outlined below to translate local cash flows to US dollars:

Date	Cash (€) Euro	Cash (US \$)				
		Exchange Rate	Option 1	Option 2	Option 3	Option 4
			Δ US\$ Cash	Period Specific	Δ € Cash Weighted Avg.	Δ € Cash Period End
January 1 Balance	€ 10,000	1.36	\$13,600			
February 10 Receipt	€ 10,200	1.40		\$14,280		
March 1 Payment	€ (10,500)	1.35		(\$14,175)		
March 31 Balance	€ 9,700	1.32	\$12,804			
"Cash Flow"	€ (300)		(\$796)	\$105	(\$412)	(\$396)
Weighted Avg.		1.372				
Change in Cash	€ (300)		(\$796)	(\$796)	(\$796)	(\$796)
Exchange Gain/(Loss)	0		\$0	(\$901)	(\$384)	(\$400)

Which of the four options above would be reported to senior management/board of directors?

- Option 1
- Option 2
- Option 3
- Option 4
- Don't know

Panel B: Unconditional survey responses

Which of the four options above would be reported to senior management/board of directors?					
Obs.	Option 1	Option 2	Option 3	Option 4	Don't know
66	27.27%	10.61%	9.09%	21.21%	31.82%

Table 6: Data on whether FX gains and losses are isolated for executives and investors?*Panel A: Unconditional survey responses*

If material (e.g. >5% impact), do you isolate the currency (translation) effect in your presentation results for:				
	Board and Senior Management			
	Obs.	Yes	No	Not Sure
Reported Revenue	110	74.55%	22.73%	2.73%
Operating costs	107	55.14%	41.12%	3.74%
Net income	109	70.64%	27.52%	1.83%
Operating cash flow	108	37.04%	59.26%	3.70%
Assets	108	22.22%	75.00%	2.78%
Liabilities	107	22.43%	74.77%	2.80%
	Investors and Analysts			
	Obs.	Yes	No	Not Sure
Reported Revenue	102	63.73%	33.33%	2.94%
Operating costs	100	38.00%	59.00%	3.00%
Net income	102	58.82%	39.22%	1.96%
Operating cash flow	102	24.51%	72.55%	2.94%
Assets	101	12.87%	85.15%	1.98%
Liabilities	101	13.86%	84.16%	1.98%

Panel B: Conditional survey responses

If material (e.g. >5% impact), do you isolate the currency (translation) effect in your presentation results for:																				
Board and Senior Manag		Public vs. Private			Foreign Contribution					Revenue		Guidance		Hedge Aggressiveness						
reported		Public	Private		High	Med	Low	H/L	H/M	M/L	High	Low	Yes	No	Do Nothing	Middle	Aggressive	N/M	N/A	M/A
	Yes	82.89%	55.88%	***	82.14%	70.97%	60.87%	**			86.96%	52.50%	***	81.58%	58.82%	**	55.56%	82.61%	80.00%	*
	No	14.47%	41.18%	***	16.07%	22.58%	39.13%	**			11.59%	42.50%	***	15.79%	38.24%	***	44.44%	15.22%	15.56%	**
	Not	2.63%	2.94%		1.79%	6.45%	0.00%				1.45%	5.00%		2.63%	2.94%		0.00%	2.17%	4.44%	
n		76	34		56	31	23				69	40		76	34		9	46	45	
Operating costs	Yes	61.64%	41.18%	**	59.26%	51.61%	50.00%				63.64%	40.00%	**	57.33%	50.00%		33.33%	71.74%	50.00%	**
	No	34.25%	55.88%	**	37.04%	41.94%	50.00%				34.85%	52.50%	*	38.67%	46.88%		66.67%	26.09%	42.86%	**
	Not	4.11%	2.94%		3.70%	6.45%	0.00%				1.52%	7.50%		4.00%	3.13%		0.00%	2.17%	7.14%	
n		73	34		54	31	22				66	40		75	32		9	46	42	
Net income	Yes	80.00%	50.00%	***	80.36%	63.33%	56.52%	**	*		80.88%	52.50%	***	74.67%	61.76%		33.33%	76.09%	80.00%	**
	No	18.67%	47.06%	***	17.86%	33.33%	43.48%	**			19.12%	42.50%	***	24.00%	35.29%		66.67%	21.74%	17.78%	***
	Not	1.33%	2.94%		1.79%	3.33%	0.00%				0.00%	5.00%	*	1.33%	2.94%		0.00%	2.17%	2.22%	***
n		75	34		56	30	23				68	40		75	34		9	46	45	
Operating cash	Yes	37.33%	36.36%		39.29%	34.48%	34.78%				37.31%	37.50%		42.67%	24.24%	*	11.11%	43.48%	39.53%	*
	No	58.67%	60.61%		57.14%	58.62%	65.22%				61.19%	55.00%		53.33%	72.73%	*	88.89%	54.35%	53.49%	*
	Not	4.00%	3.03%		3.57%	6.90%	0.00%				1.49%	7.50%		4.00%	3.03%		0.00%	2.17%	6.98%	**
n		75	33		56	29	23				67	40		75	33		9	46	43	
Assets	Yes	21.62%	23.53%		25.00%	10.34%	30.43%			*	20.90%	25.00%		27.03%	11.76%	*	0.00%	26.09%	25.00%	*
	No	75.68%	73.53%		73.21%	82.76%	69.57%				77.61%	70.00%		70.27%	85.29%		100.00%	69.57%	72.73%	*
	Not	2.70%	2.94%		1.79%	6.90%	0.00%				1.49%	5.00%		2.70%	2.94%		0.00%	4.35%	2.27%	
n		74	34		56	29	23				67	40		74	34		9	46	44	
Liabilities	Yes	22.97%	21.21%		26.79%	10.34%	27.27%			*	21.21%	25.00%		28.38%	9.09%	**	0.00%	28.26%	23.26%	*
	No	74.32%	75.76%		71.43%	82.76%	72.73%				77.27%	70.00%		68.92%	87.88%	**	100.00%	67.39%	74.42%	**
	Not	2.70%	3.03%		1.79%	6.90%	0.00%				1.52%	5.00%		2.70%	3.03%		0.00%	4.35%	2.33%	*
n		74	33		56	29	22				66	40		74	33		9	46	43	

Panel B: Conditional survey responses

(cont'd)																				
Investors and Analysts		Public vs. Private			Foreign Contribution					Revenue		Guidance		Hedge Aggressiveness						
Reported		Public	Private		High	Med	Low	H/L	H/M	M/L	High	Low	Yes	No	Do Nothing	Middle	Aggressive	N/M	N/A	M/A
Reported	Yes	73.61%	40.00%	***	74.51%	64.29%	39.13%	***	*		79.69%	35.14%	***	72.22%	43.33%	***	57.14%	68.18%	70.00%	
	No	23.61%	56.67%	***	23.53%	28.57%	60.87%	***	**		18.75%	59.46%	***	25.00%	53.33%	***	42.86%	29.55%	25.00%	
	Not	2.78%	3.33%		1.96%	7.14%	0.00%				1.56%	5.41%		2.78%	3.33%		0.00%	2.27%	5.00%	
n		72	30		51	28	23				64	37		72	30		7	44	40	
Operating costs	Yes	44.29%	23.33%	**	44.90%	35.71%	26.09%				48.39%	18.92%	***	43.66%	24.14%	*	28.57%	53.49%	28.21%	**
	No	52.86%	73.33%	*	53.06%	57.14%	73.91%		*		50.00%	75.68%	**	53.52%	72.41%	*	71.43%	44.19%	66.67%	**
	Not	2.86%	3.33%		2.04%	7.14%	0.00%				1.61%	5.41%		2.82%	3.45%		0.00%	2.33%	5.13%	
n		70	30		49	28	23				62	37		71	29		7	43	39	
Net income	Yes	66.67%	40.00%	**	73.08%	48.15%	39.13%	**	***		68.75%	40.54%	***	64.79%	45.16%	*	28.57%	63.64%	63.41%	*
	No	31.94%	56.67%	**	25.00%	48.15%	60.87%	**	***		31.25%	54.05%	**	33.80%	51.61%	*	71.43%	34.09%	34.15%	*
	Not	1.39%	3.33%		1.92%	3.70%	0.00%				0.00%	5.41%	*	1.41%	3.23%		0.00%	2.27%	2.44%	
n		72	30		52	27	23				64	37		71	31		7	44	41	
Operating cash flow	Yes	23.61%	26.67%		27.45%	28.57%	13.04%				25.00%	24.32%		29.58%	12.90%	*	14.29%	32.56%	19.51%	
	No	73.61%	70.00%		70.59%	64.29%	86.96%		*		73.44%	70.27%		67.61%	83.87%	*	85.71%	65.12%	75.61%	
	Not	2.78%	3.33%		1.96%	7.14%	0.00%				1.56%	5.41%		2.82%	3.23%		0.00%	2.33%	4.88%	
n		72	30		51	28	23				64	37		71	31		7	43	41	
Assets	Yes	9.86%	20.00%		15.38%	7.69%	13.04%				9.52%	18.92%		14.08%	10.00%		0.00%	18.18%	10.00%	
	No	88.73%	76.67%		82.69%	88.46%	86.96%				90.48%	75.68%	**	84.51%	86.67%		100.00%	79.55%	87.50%	
	Not	1.41%	3.33%		1.92%	3.85%	0.00%				0.00%	5.41%	*	1.41%	3.33%		0.00%	2.27%	2.50%	
n		71	30		52	26	23				63	37		71	30		7	44	40	
Liabilities	Yes	11.27%	20.00%		17.31%	7.69%	13.04%				11.11%	18.92%		15.49%	10.00%		0.00%	20.45%	10.00%	
	No	87.32%	76.67%		80.77%	88.46%	86.96%				88.89%	75.68%	*	83.10%	86.67%		100.00%	77.27%	87.50%	
	Not	1.41%	3.33%		1.92%	3.85%	0.00%				0.00%	5.41%	*	1.41%	3.33%		0.00%	2.27%	2.50%	
n		71	30		52	26	23				63	37		71	30		7	44	40	

Note: Z-tests for comparing two proportions are used, *** p<0.01, ** p<0.05, * p<0.1

Table 7: Data on who decides targeted or budgeted FX rates*Unconditional survey responses*

Who decides on the expected exchange rates used for targets and budgets for foreign businesses?					
Obs.	CFO	Treasurer	Controller	Local CFO or Treasurer	Other
155	40.00%	29.03%	13.55%	6.45%	10.97%

Table 8: Data on whether FX gains and losses are incorporated into compensation decisions*Unconditional survey responses*

Are the gains and losses on FX fluctuations ignored in compensation/bonus decisions?				
	Corporate Executives			
	Obs.	Yes	No	Not Sure
Transaction gains/losses included in earnings	116	47.41%	48.28%	4.31%
FX (Translation) impact on: Reported Revenues	114	50.00%	44.74%	5.26%
FX (Translation) impact on: Costs or Margins	114	45.61%	49.12%	5.26%
FX (Translation) impact on: Earnings or EPS	113	46.90%	47.79%	5.31%
Translation gains/losses in Other Comprehensive Income (OCI)	113	46.02%	48.67%	5.31%
Exchange gains/losses in statement of cash flows	114	44.74%	50.88%	4.39%
	Local Managers			
	Obs.	Yes	No	Not Sure
Transaction gains/losses included in earnings	108	45.37%	47.22%	7.41%
FX (Translation) impact on: Reported Revenues	107	53.27%	39.25%	7.48%
FX (Translation) impact on: Costs or Margins	105	45.71%	46.67%	7.62%
FX (Translation) impact on: Earnings or EPS	105	48.57%	44.76%	6.67%
Translation gains/losses in Other Comprehensive Income (OCI)	104	47.12%	45.19%	7.69%
Exchange gains/losses in statement of cash flows	103	44.66%	47.57%	7.77%

Table 9: Data on firms' proclivity for managing FX risk

Panel A: Unconditional survey responses

Where, on the following continuum, does your company's policy for managing foreign currency (FX) risk fall?					
	1=	2=	3=	4=	5=
Obs.	Do Nothing				Aggressively mitigate FX volatility
112	11.61%	18.75%	25.89%	24.11%	19.64%

Panel B: Conditional survey responses

Where, on the following continuum, does your company's policy for managing foreign currency (FX) risk fall?													
	Public vs. Private			Foreign Contribution				Revenue			Guidance		
	Public	Private		High	Med	Low	H/L	High	Low		Yes	No	
1 = Do nothing	1.33%	33.33%	***	5.36%	13.79%	22.73%	**	4.17%	23.53%	***	7.79%	21.88%	**
2	17.33%	21.21%		16.07%	20.69%	22.73%		16.67%	23.53%		14.29%	28.13%	*
3	30.67%	15.15%	*	30.36%	24.14%	18.18%		25.00%	26.47%		28.57%	18.75%	
4	28.00%	15.15%		26.79%	24.14%	18.18%		29.17%	14.71%		27.27%	15.63%	
5 = Aggressive	22.67%	15.15%		21.43%	17.24%	18.18%		25.00%	11.76%		22.08%	15.63%	
n	75	33		56	29	22		72	34		77	32	

Table 10: Data on firms' motivations to hedge foreign currency risk exposure*Panel A: Unconditional analyses*

What are primary motivations for hedging (can be more than one)?			
	Yes	No	Not Sure
Ensure the rate for a transaction(s)	76.7%	21.1%	2.2%
Facilitate reporting of budgeted amount	38.2%	59.6%	2.3%
Reduce volatility of reported numbers e.g. earnings	73.4%	23.4%	3.2%
Ensure rate for actual cash flow	62.2%	32.2%	5.6%
Reduce volatility of cash flows	77.2%	21.7%	1.1%
Reduce local management's concern with FX impact on Parent's performance measures	50.6%	47.3%	2.2%

What are primary motivations for NOT hedging (can be more than one)?			
	Yes	No	Not Sure
Benefit of hedging does not justify the cost	68.0%	26.7%	5.3%
We are sufficiently diversified internationally	43.1%	52.8%	4.2%
Our investors understand the exposure	39.4%	52.1%	8.5%
Our business has sufficient natural hedges	58.7%	37.3%	4.0%
Our board does not support use of derivatives other than in special cases	20.0%	71.4%	8.6%

Panel A: Conditional analyses

What are primary motivations for hedging (can be more than one)?														
		Public vs. Private		Foreign Contribution				Revenue		Guidance		Hedge Aggressiveness		
		Public	Private	High	Med	Low	H/M	High	Low	Yes	No	Middle	Aggressive	
Ensure the rate for a transaction(s)	Yes	76.47%	76.19%	79.17%	72.00%	75.00%		74.60%	80.00%	75.38%	82.61%	72.92%	80.95%	
	No	20.59%	23.81%	18.75%	24.00%	25.00%		22.22%	20.00%	21.54%	17.39%	22.92%	19.05%	
	Not sure	2.94%	0.00%	2.08%	4.00%	0.00%		3.17%	0.00%	3.08%	0.00%	4.17%	0.00%	
	n	68	21	48	25	16		63	25	65	23	48	42	
Facilitate reporting of budgeted amount	Yes	42.03%	25.00%	37.25%	41.67%	35.71%		37.50%	41.67%	45.45%	18.18%	23.91%	53.49%	***
	No	56.52%	70.00%	58.82%	58.33%	64.29%		59.38%	58.33%	51.52%	81.82%	73.91%	44.19%	***
	Not sure	1.45%	5.00%	3.92%	0.00%	0.00%		3.13%	0.00%	3.03%	0.00%	2.17%	2.33%	
	n	69	20	51	24	14		64	24	66	22	46	43	
Reduce volatility of reported numbers e.g. earnings	Yes	78.08%	57.14% *	80.77%	60.00%	68.75%	*	73.13%	73.08%	73.91%	75.00%	66.67%	80.43%	
	No	19.18%	38.10% *	15.38%	36.00%	31.25%	**	22.39%	26.92%	21.74%	25.00%	31.25%	15.22%	*
	Not sure	2.74%	4.76%	3.85%	4.00%	0.00%		4.48%	0.00%	4.35%	0.00%	2.08%	4.35%	
	n	73	21	52	25	16		67	26	69	24	48	46	
Ensure rate for actual cash flow	Yes	60.87%	66.67%	57.14%	72.00%	62.50%		61.90%	65.38%	60.61%	65.22%	51.06%	74.42%	**
	No	33.33%	28.57%	34.69%	24.00%	37.50%		30.16%	34.62%	31.82%	34.78%	42.55%	20.93%	**
	Not sure	5.80%	4.76%	8.16%	4.00%	0.00%		7.94%	0.00%	7.58%	0.00%	6.38%	4.65%	
	n	69	21	49	25	16		63	26	66	23	47	43	
Reduce volatility of cash flows	Yes	77.46%	76.19%	76.47%	79.17%	75.00%		78.46%	73.08%	80.88%	65.22%	72.34%	82.22%	
	No	21.13%	23.81%	23.53%	16.67%	25.00%		20.00%	26.92%	17.65%	34.78%	27.66%	15.56%	
	Not sure	1.41%	0.00%	0.00%	4.17%	0.00%		1.54%	0.00%	1.47%	0.00%	0.00%	2.22%	
	n	71	21	51	24	16		65	26	68	23	47	45	
Reduce local management's concern with FX impact on Parent's performance measures	Yes	55.71%	33.33% *	54.90%	45.83%	43.75%		59.09%	25.00%	57.58%	33.33%	41.30%	60.00%	*
	No	41.43%	66.67% **	43.14%	50.00%	56.25%		37.88%	75.00%	39.39%	66.67%	56.52%	37.78%	*
	Not sure	2.86%	0.00%	1.96%	4.17%	0.00%		3.03%	0.00%	3.03%	0.00%	2.17%	2.22%	
	n	70	21	51	24	16		66	24	66	24	46	45	

What are primary motivations for NOT hedging (can be more than one)?																			
		Public vs. Private		Foreign Contribution			Revenue			Guidance		Hedge Aggressiveness							
		Public	Private	High	Med	Low	H/M	H/L	M/L	High	Low	Yes	No	Do Nothing	Middle	Aggressive	N/A	M/A	N/A
Benefit of hedging does not justify the cost	Yes	65.38%	73.91%	67.50%	66.67%	71.43%				66.00%	70.83%	70.00%	62.50%	83.33%	78.05%	40.91%	**	***	
	No	28.85%	21.74%	30.00%	19.05%	28.57%				28.00%	25.00%	24.00%	33.33%	16.67%	14.63%	54.55%	**	***	
	Not sure	5.77%	4.35%	2.50%	14.29%	0.00%	*			6.00%	4.17%	6.00%	4.17%	0.00%	7.32%	4.55%			
	n		52	23	40	21	14				50	24	50	24	12	41	22		
We are sufficiently diversified internationally	Yes	38.78%	52.17%	47.37%	38.10%	38.46%				40.43%	45.83%	41.67%	47.83%	54.55%	48.78%	25.00%		*	
	No	55.10%	47.83%	50.00%	52.38%	61.54%				55.32%	50.00%	52.08%	52.17%	45.45%	46.34%	70.00%		*	
	Not sure	6.12%	0.00%	2.63%	9.52%	0.00%				4.26%	4.17%	6.25%	0.00%	0.00%	4.88%	5.00%			
	n		49	23	38	21	13				47	24	48	23	11	41	20		
Our investors understand the exposure	Yes	28.57%	63.64%	***	35.14%	50.00%	35.71%			36.17%	47.83%	38.78%	38.10%	63.64%	40.00%	25.00%	**		
	No	59.18%	36.36%	*	54.05%	40.00%	64.29%			53.19%	47.83%	51.02%	57.14%	27.27%	50.00%	70.00%	**		
	Not sure	12.24%	0.00%	*	10.81%	10.00%	0.00%			10.64%	4.35%	10.20%	4.76%	9.09%	10.00%	5.00%			
	n		49	22	37	20	14				47	23	49	21	11	40	20		
Our business has sufficient natural hedges	Yes	59.62%	56.52%	64.10%	52.38%	53.33%				55.10%	68.00%	62.75%	52.17%	54.55%	63.41%	52.17%			
	No	34.62%	43.48%	33.33%	38.10%	46.67%				40.82%	28.00%	31.37%	47.83%	45.45%	31.71%	43.48%			
	Not sure	5.77%	0.00%	2.56%	9.52%	0.00%				4.08%	4.00%	5.88%	0.00%	0.00%	4.88%	4.35%			
	n		52	23	39	21	15				49	25	51	23	11	41	23		
Our board does not support use of derivatives other than in special cases	Yes	14.29%	33.33%	*	10.81%	30.00%	30.77%	*	*	8.70%	43.48%	***	20.83%	19.05%	50.00%	15.00%	15.00%	**	**
	No	75.51%	61.90%		83.78%	50.00%	69.23%	***		80.43%	52.17%	**	68.75%	76.19%	30.00%	77.50%	80.00%	***	***
	Not sure	10.20%	4.76%		5.41%	20.00%	0.00%	*	*	10.87%	4.35%		10.42%	4.76%	20.00%	7.50%	5.00%		
	n		49	21	37	20	13				46	23	48	21	10	40	20		

Table 11: Data on whether accounting standards affect firms' risk management activities?

Panel A: Unconditional survey responses

How do current accounting standards for hedging (e.g. FAS 133 now ASC815) affect your ability to manage the foreign currency (FX) exposure you face?			
Obs.	No effect	Constrain our ability to manage our FX exposure	Facilitate our ability to manage FX exposure
104	51.92%	37.50%	10.25%

Panel B: Conditional survey responses

	Public vs. Private		Foreign Contribution			Revenue		Guidance		Hedge Aggressiveness					
	Public	Private	High	Med	Low	High	Low	Yes	No	Do Nothing	Middle	Aggressive	N/M		
Accounting standards have no effect	42.25%	82.76% ***	49.02%	62.96%	57.14%	45.59%	73.33%	**	44.29%	73.33%	***	80.00%	47.83%	52.17%	*
Accounting standards constrain our ability to manage FX exposure	45.07%	10.34% ***	39.22%	25.93%	33.33%	41.18%	20.00%	**	40.00%	26.67%		10.00%	43.48%	34.78%	**
Accounting standards facilitate our ability to manage FX exposure	12.68%	6.90%	11.76%	11.11%	9.52%	13.24%	6.67%		15.71%	0.00%	**	10.00%	8.70%	13.04%	
n	71	29	51	27	21	68	30		70	30		10	46	46	

Table 12: Data on foreign currency borrowing if local interest rates are cheap

Panel A: Unconditional survey responses

Does the foreign subsidiary or centralized treasury borrow funds in non-functional currencies if they think the local interest rates are low/cheap?			
Obs.	Yes	No	Not Sure
105	40.95%	56.19%	2.86%

Panel B: Unconditional survey responses

Does the foreign subsidiary or centralized treasury borrow funds in non-functional currencies?														
	Public vs. Private		Foreign Contribution			H/M	Revenue		Guidance		Hedge Aggressiveness			N/M
	Public	Private	High	Med	Low		High	Low	Yes	No	Do Nothing	Middle	Aggressive	
Yes	40.85%	33.33%	47.06%	25.93%	31.82%	*	44.12%	25.81%	*	40.85%	33.33%	18.18%	43.48%	41.30%
No	57.75%	60.00%	49.02%	70.37%	68.18%	*	54.41%	67.74%	57.75%	60.00%	81.82%	52.17%	56.52%	*
Not sure	1.41%	6.67%	3.92%	3.70%	0.00%		1.47%	6.45%	1.41%	6.67%	0.00%	4.35%	2.17%	
n	71	30	51	27	22		68	31	71	30	11	46	46	

Table 13: Data on what exposures do firms hedge?

Panel A: Unconditional survey responses

What material foreign currency exposures, if any, do you hedge?				
	Obs.	Yes	No	Not Sure
Reported revenue	92	38.04%	59.78%	2.17%
Receivables	98	58.16%	39.80%	2.04%
Reported costs	90	42.22%	54.44%	3.33%
Payables	97	67.01%	30.93%	2.06%
Net income	91	32.97%	64.84%	2.20%
Specific cash flows	91	63.74%	32.97%	3.30%
Net investment (CTA)	97	30.93%	67.01%	2.06%
Shareholder's equity	89	6.74%	91.01%	2.25%
Dividends (to the parent)	90	35.56%	62.22%	2.22%
Other	71	5.63%	85.92%	8.45%

Panel B: Conditional survey responses

What material foreign currency exposures, if any, do you hedge?																		
		Public vs. Private		Foreign Contribution					Revenue		Guidance		Hedge Aggressiveness					
		Public	Private	High	Med	Low	H/M	H/L	M/L	High	Low	Yes	No	Do Nothing	Middle	Aggressive	M/A	
Reported revenue	Yes	36.92%	38.46%	47.83%	25.00%	29.41%	*			35.38%	40.00%	39.68%	35.71%	25.00%	27.27%	52.50%	**	
	No	60.00%	61.54%	52.17%	67.86%	70.59%				63.08%	56.00%	57.14%	64.29%	75.00%	68.18%	47.50%	*	
	Not sure	3.08%	0.00%	0.00%	7.14%	0.00%	*			1.54%	4.00%	3.17%	0.00%	0.00%	4.55%	0.00%		
n		65	26	46	28	17				65	25	63	28	8	44	40		
Receivables	Yes	61.11%	50.00%	74.51%	42.86%	33.33%	***	***		59.42%	53.57%	58.82%	58.62%	25.00%	48.89%	73.33%	**	
	No	36.11%	50.00%	25.49%	50.00%	66.67%	**	***		39.13%	42.86%	38.24%	41.38%	75.00%	46.67%	26.67%	**	
	Not sure	2.78%	0.00%	0.00%	7.14%	0.00%	*			1.45%	3.57%	2.94%	0.00%	0.00%	4.44%	0.00%		
n		72	26	51	28	18				69	28	68	29	8	45	45		
Reported costs	Yes	49.23%	20.83%	**	50.00%	19.23%	52.94%	**	**	45.31%	33.33%	48.39%	26.92%	*	0.00%	30.95%	61.54%	***
	No	46.15%	79.17%	***	50.00%	69.23%	47.06%			51.56%	62.50%	46.77%	73.08%	**	100.00%	61.90%	38.46%	**
	Not sure	4.62%	0.00%		0.00%	11.54%	0.00%	**		3.13%	4.17%	4.84%	0.00%		0.00%	7.14%	0.00%	*
n		65	24	46	26	17				64	24	62	26	8	42	39		
Payables	Yes	73.61%	50.00%	**	78.43%	46.15%	66.67%	***		72.46%	57.69%	68.57%	65.38%	12.50%	65.12%	78.26%		
	No	23.61%	50.00%	**	21.57%	46.15%	33.33%	**		26.09%	38.46%	28.57%	34.62%	87.50%	30.23%	21.74%		
	Not sure	2.78%	0.00%		0.00%	7.69%	0.00%	**		1.45%	3.85%	2.86%	0.00%	0.00%	4.65%	0.00%		
n		72	24	51	26	18				69	26	70	26	8	43	46		
Net income	Yes	31.34%	37.50%		34.04%	33.33%	25.00%			30.30%	41.67%	34.92%	29.63%	12.50%	25.58%	45.00%	*	
	No	65.67%	62.50%		65.96%	59.26%	75.00%			68.18%	54.17%	61.90%	70.37%	87.50%	69.77%	55.00%		
	Not sure	2.99%	0.00%		0.00%	7.41%	0.00%	*		1.52%	4.17%	3.17%	0.00%	0.00%	4.65%	0.00%		
n		67	24	47	27	16				66	24	63	27	8	43	40		
Specific cash flows	Yes	62.69%	66.67%		65.96%	59.26%	64.71%			64.06%	64.00%	67.69%	52.00%	25.00%	60.00%	76.32%		
	No	34.33%	29.17%		31.91%	33.33%	35.29%			34.38%	28.00%	29.23%	44.00%	75.00%	35.56%	21.05%		
	Not sure	2.99%	4.17%		2.13%	7.41%	0.00%			1.56%	8.00%	3.08%	4.00%	0.00%	4.44%	2.63%		
n		67	24	47	27	17				64	25	65	25	8	45	38		

Panel B: Conditional survey responses (continued)

(cont'd)		Public vs. Private		Foreign Contribution				Revenue			Guidance		Hedge Aggressiveness			
		Public	Private	High	Med	Low	H/M	H/L	M/L	High	Low	Yes	No	Do Nothing	Middle	Aggressive
Net investment (CTA)	Yes	35.62%	17.39%	37.74%	15.38%	31.25%	**			30.43%	32.00%	33.82%	25.00%	0.00%	29.55%	37.78%
	No	61.64%	82.61%	* 62.26%	76.92%	68.75%				68.12%	64.00%	63.24%	75.00%	100.00%	65.91%	62.22%
	Not sure	2.74%	0.00%	0.00%	7.69%	0.00%	**			1.45%	4.00%	2.94%	0.00%	0.00%	4.55%	0.00%
n		73	23	53	26	16				69	25	68	28	8	44	45
Shareholder equity	Yes	6.06%	8.70%	8.70%	92.31%	6.25%	***	***		6.15%	8.70%	6.35%	8.00%	0.00%	9.52%	5.13%
	No	90.91%	91.30%	91.30%	7.69%	93.75%	***	***		92.31%	86.96%	90.48%	92.00%	100.00%	85.71%	94.87%
	Not sure	3.03%	0.00%	0.00%	0.00%	0.00%				1.54%	4.35%	3.17%	0.00%	0.00%	4.76%	0.00%
n		66	23	46	26	16				65	23	63	25	8	42	39
Dividends (to parent)	Yes	35.82%	34.78%	47.92%	19.23%	25.00%	**			38.46%	29.17%	38.10%	30.77%	0.00%	33.33%	45.00%
	No	61.19%	65.22%	52.08%	73.08%	75.00%	*			60.00%	66.67%	58.73%	69.23%	100.00%	61.90%	55.00%
	Not sure	2.99%	0.00%	0.00%	7.69%	0.00%	*			1.54%	4.17%	3.17%	0.00%	0.00%	4.76%	0.00%
n		67	23	48	26	16				65	24	63	26	8	42	40
Other	Yes	5.66%	5.56%	5.41%	9.09%	0.00%				6.00%	4.76%	6.00%	5.00%	0.00%	8.11%	3.57%
	No	84.91%	88.89%	89.19%	77.27%	91.67%				86.00%	85.71%	84.00%	90.00%	100.00%	81.08%	89.29%
	Not sure	9.43%	5.56%	5.41%	13.64%	8.33%				8.00%	9.52%	10.00%	5.00%	0.00%	10.81%	7.14%
n		53	18	37	22	12				50	21	50	20	6	37	28

Table 14: Data on hedging to a non-functional currency

Hypothetical scenario: You have a USD parent and a European subsidiary with a Euro functional currency. The European subsidiary has revenue (or costs or net income see above) in sterling of £100,000. Do you hedge the sterling revenue (or costs or net income) to: (i) Euros (the functional currency); (ii) USD (the reporting currency); (iii) both; (iv) Don't know.

Panel A: Unconditional survey responses

Hypothetical scenario: do you hedge the sterling revenue (or costs or net income) to...

Obs.	Euros	USD	Both	Don't know
52	42.31%	28.85%	19.23%	9.62%

Table 15: Data on purchasing a derivative to alter reported ratios

Hypothetical scenario: Half way through the year your USD translated EPS is up 5% from FX fluctuations (zero organic growth). What is the probability that your company will purchase a derivative that will enable you to ensure 5% growth from currency is sustained through your year-end results?

Panel A: Unconditional survey responses

Hypothetical scenario: What is the probability that your company will purchase a derivative?

Obs.	0%	25%	50%	75%	100%
96	64.58%	10.42%	14.58%	6.25%	4.17%

If you intended to distribute the earnings to the parent company how would your answer differ?

Obs.	Increase	Decrease	No change	Don't know
97	30.93%	1.03%	58.76%	9.28%

Panel B: Conditional survey responses

Q11. Hypothetical scenario: What is the probability that your company will purchase a derivative?

	Public vs. Private		Foreign Contribution				Revenue		Guidance		Hedge Aggressiveness				
	Public	Private	High	Med	Low	H/M	H/L	High	Low	Yes	No	Do Nothing	Middle	Aggressive	
0%	60.29%	75.00%	68.63%	57.69%	61.11%			66.67%	57.14%	58.82%	77.78%	*	70.00%	72.09%	55.81%
25%	10.29%	10.71%	1.96%	19.23%	22.22%	***	***	10.61%	10.71%	11.76%	7.41%		20.00%	9.30%	9.30%
50%	16.18%	10.71%	17.65%	11.54%	11.11%			16.67%	10.71%	17.65%	7.41%		10.00%	11.63%	18.60%
75%	8.82%	0.00%	5.88%	11.54%	0.00%			4.55%	10.71%	8.82%	0.00%		0.00%	4.65%	9.30%
100%	4.41%	3.57%	5.88%	0.00%	5.56%			1.52%	10.71%	**	2.94%	7.41%	0.00%	2.33%	6.98%
n	68	28	51	26	18			66	28	68	27	10	43	43	

Q11.2. If you intended to distribute the earnings to the parent company how would your answer differ?

	Public vs. Private		Foreign Contribution				Revenue		Guidance		Hedge Aggressiveness				
	Public	Private	High	Med	Low	M/L	High	Low	Yes	No	Do Nothing	Middle	Aggressive	N/M	N/A
Increase	28.99%	35.71%	29.41%	34.62%	31.58%		29.85%	35.71%	30.43%	33.33%	10.00%	34.88%	31.82%		
Decrease	1.45%	0.00%	1.96%	0.00%	0.00%		1.49%	0.00%	1.45%	0.00%	0.00%	2.33%	0.00%		
No change	59.42%	57.14%	60.78%	46.15%	68.42%		58.21%	57.14%	59.42%	55.56%	90.00%	48.84%	61.36%	**	*
Don't know	10.14%	7.14%	7.84%	19.23%	0.00%	**	10.45%	7.14%	8.70%	11.11%	0.00%	13.95%	6.82%		
n	69	28	51	26	19		67	28	69	27	10	43	44		

Table 16: Data on how executives manage OCI related foreign currency gains and losses

Hypothetical scenario: During the year, the translation adjustment you report in OCI, reflects a loss equivalent to 30% of this year's expected net income. What, if anything, do you do in response?

Panel A: Unconditional survey responses

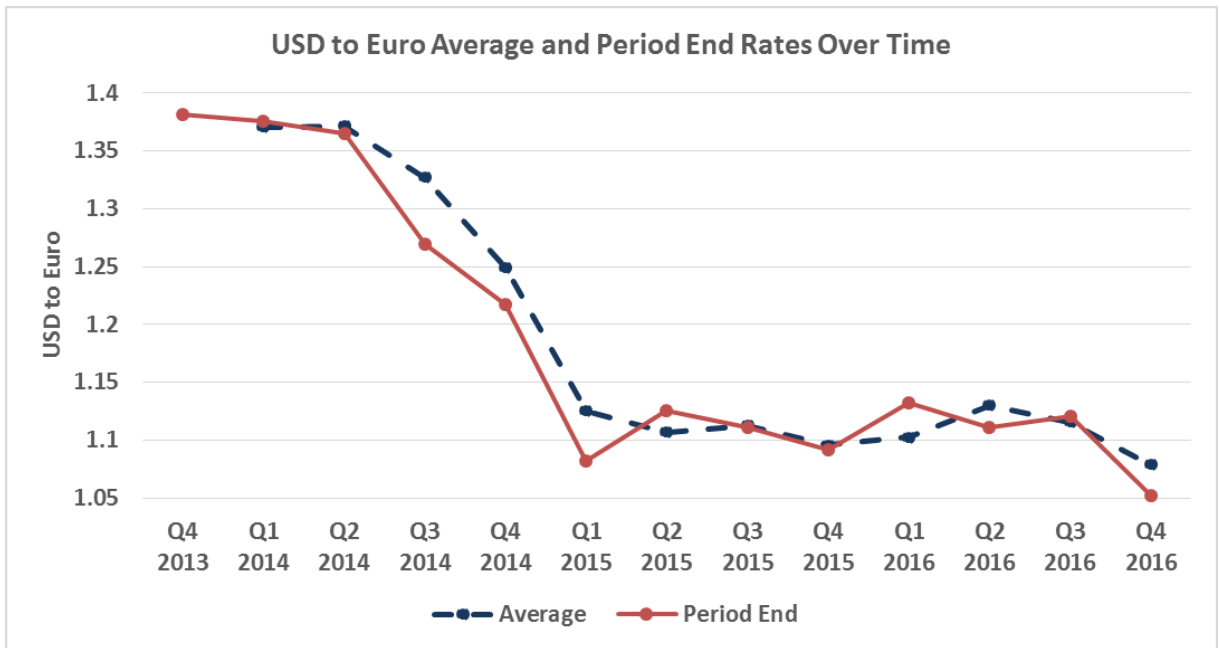
Hypothetical scenario: What, if anything, do you do in response?					
Obs.	Adjust funding source	Hedge to limited reported loss	Nothing	Other	Don't know
98	62.24%	13.27%	11.22%	6.12%	7.14%

Panel B: Conditional survey responses

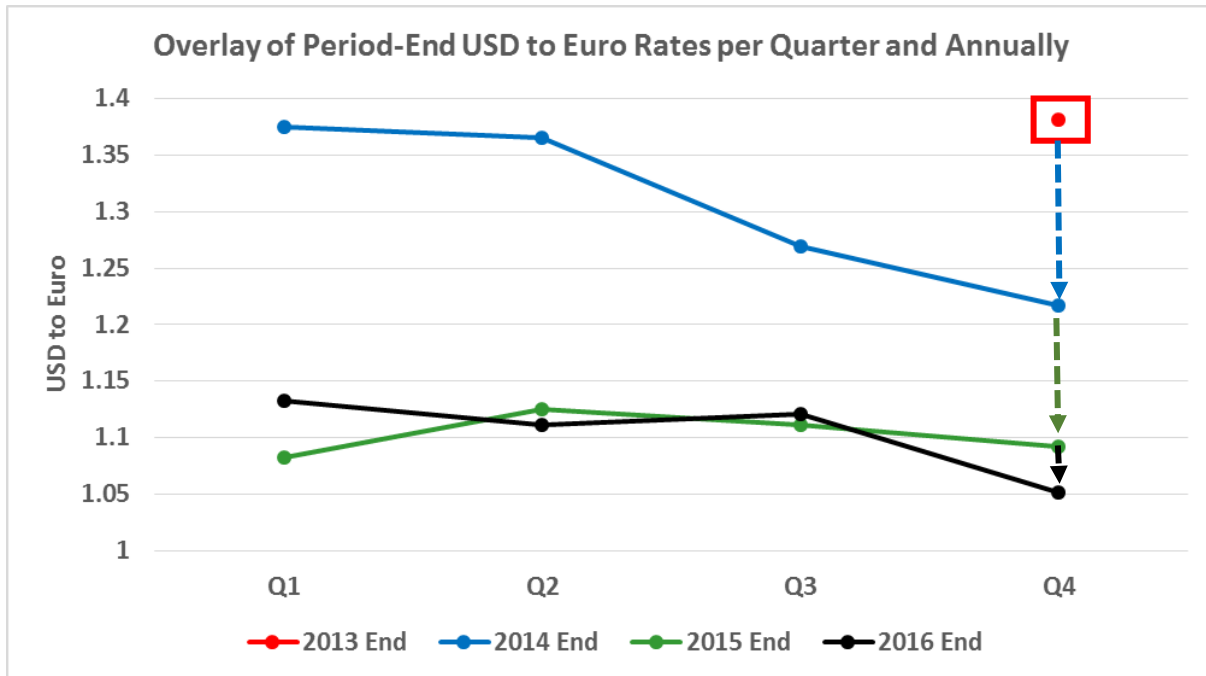
Hypothetical scenario: What, if anything, do you do in response?														
	Public vs. Private		Foreign Contribution			Revenue		Guidance		Hedge Aggressiveness				
	Public	Private	High	Med	Low	High	Low	Yes	No	Do Nothing	Middle	Aggressive		
Adjust funding source	67.61%	48.15%	*	62.75%	70.37%	52.63%	68.66%	46.67%	**	65.22%	57.14%	55.56%	66.67%	59.09%
Hedge to limited reported loss	12.68%	14.81%		11.76%	7.41%	21.05%	8.96%	23.33%	*	10.14%	21.43%	11.11%	13.33%	13.64%
Nothing	7.04%	22.22%	**	13.73%	3.70%	15.79%	7.46%	20.00%	*	8.70%	14.29%	22.22%	8.89%	11.36%
Other	7.04%	3.70%		5.88%	7.41%	5.26%	8.96%	0.00%	*	7.25%	3.57%	11.11%	4.44%	6.82%
Don't know	5.63%	11.11%		5.88%	11.11%	5.26%	5.97%	10.00%		8.70%	3.57%	0.00%	6.67%	9.09%
n	71	27		51	27	19	67	30		69	28	9	45	44

Figure 1: Patterns of USD and Euro exchange rates over time

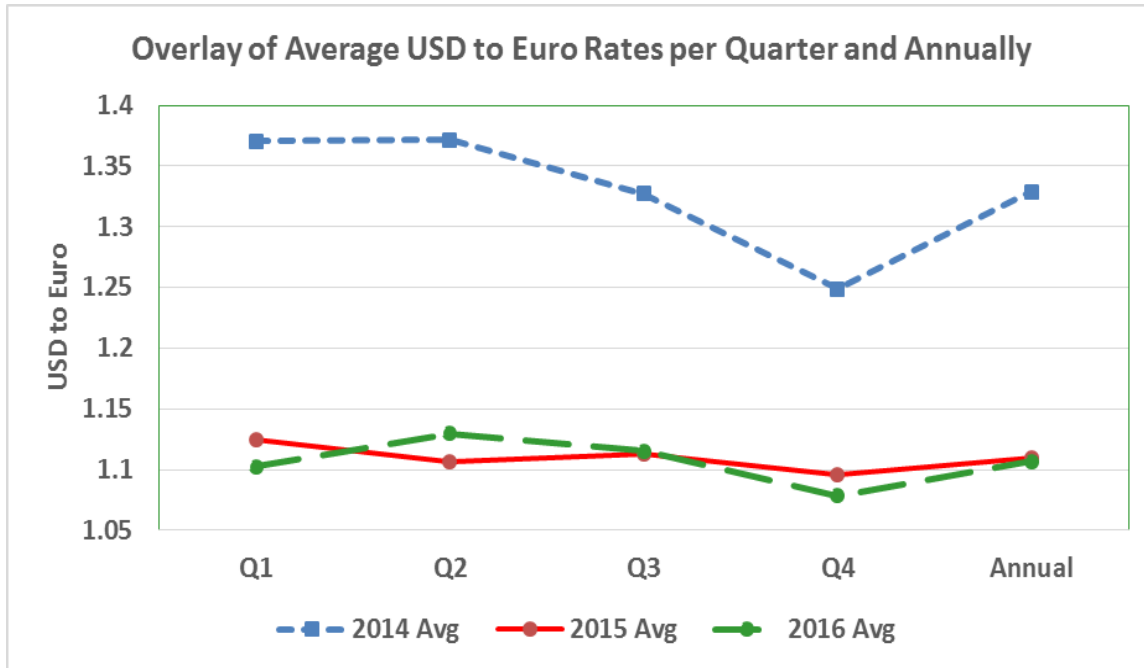
Panel A: USD - Euro average and period end rates



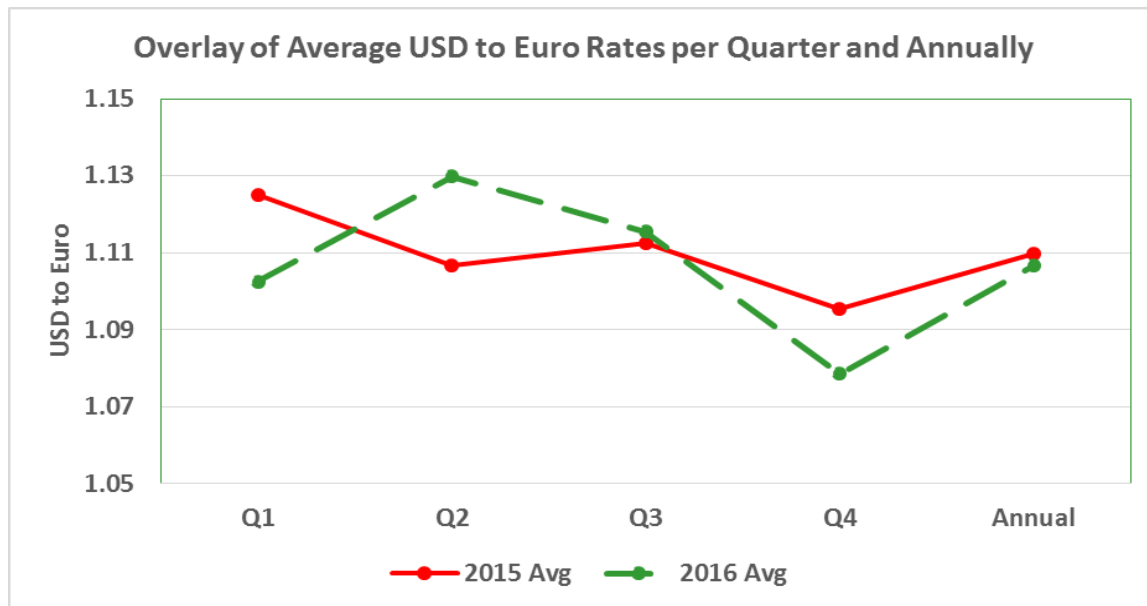
Panel B: Period end USD-Euro rates per quarter and annually



Panel C: Average USD-Euro rates per quarter and annually



Panel D: USD-Euro rates per quarter and annually



Panel C of Figure 1 shows the large structural shift in USD-Euro rates from 2014 to 2015 which, in turn, makes year-to-year comparisons of financial statements highly sensitive to exchange rates. Because of the sharp drop in Euro in 2014, the scale obscures the USD-Euro volatility in 2016 versus 2015, albeit at a lower level. We show this in panel D. Note how different the patterns are between the four quarters of the year even though the annual average rates are almost identical. Of course, there is even more volatility within the quarters suggesting actual transactions in a non-functional currency can create both transaction gains and losses and have a translation impact.

Figure 2: Cash Flows Reported using \$:€ Period-end Rates for Receivables

