Moore is Now Less? Intel Corporation’s Slowing Innovation Cycle – A Contemporary Financial Reporting Case Study: A Change in Accounting Estimate

Teaching Notes

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Case Summary

Moore’s law is an innovation principle developed and popularized by Intel's founder, Gordon Moore, in the late 1960s that presumes that innovation can reduce transistor dimensions in half at a fixed cost every two years. For over five decades, Intel Corporation relied upon this guiding principle to drive its strategy and research and development (R&D) plans. After delivering on that innovation cycle for nearly 50 years, Intel announced delays in new product releases, reduced future pace of change, and related changes to the accounting treatment for its manufacturing equipment. In this case, students learn about Moore’s law, the implications of slowing technological innovation, and the related accounting, auditing and financial reporting matters.

Teaching Objectives

By completing this case, students will:

• define Moore’s law, an innovation principle in technology industries, and debate its relevance and influence on business;
• examine a real-world “change in accounting estimate” (related to equipment depreciation at a well-known public company) that allows instructors to add a relevant example to traditional textbook-related discussions;
• access and cite accounting literature to consider the appropriate accounting treatment of a change in estimate and its related financial reporting effects;
• examine the differing views of investors and analysts regarding change in accounting estimate;
• analyze the impact of change of accounting for corporate audit.

Target Audience(s)

This case is designed for use in financial accounting courses at the undergraduate (upper division) or graduate level (i.e., MBA, Masters of Accounting, etc.). This case fits nicely in a course discussion about property, plant, and equipment (and fixed assets). Students often raise questions about changing the assumptions related to depreciation and this case provides a real-world example of such a change. In addition to the technical elements of the case, the contemporary nature of the scenario enables instructors to connect financial accounting and reporting topics to technological innovation and the economic conditions of a well-known firm. Students often respond favorably and with high motivation to cases that draw from recent business events and lend real-world applicability to traditional technical business concepts.

Suggested Teaching Strategy

Delivery of this case requires student preparation outside the classroom. The instructor may introduce the case in one class period and then require students to prepare their responses in advance of a future meeting. During the case introduction, the instructor may show the videos found on the Intel's Moore’s Law website or linked to the ABC News stories listed in the article. To successfully complete the case, students should be familiar with the Accounting Standards Codification (ASC) and read the articles by Krzanich (2016) and Newcomb (2016) listed as further reading at the end of the case. Upon the instructor’s discretion, students may submit written responses to the assigned questions or use their preparation to contribute to group/class discussions. Instructors should actively encourage class discussion of examples of technological innovations.
and their business and societal benefits.

Suggested Solutions to Case Discussion Questions

1. Visit the following web site to learn more about Moore’s law: http://www.intel.com/content/www/us/en/silicon-innovations/moores-law-technology.html. What is Moore’s law and why is it relevant to technology companies and consumers?

Moore’s law is an innovation principle developed and popularized by Intel’s founder, Gordon Moore, in the late 1960s that presumes that innovation can reduce transistor dimensions in half every two years. Thereby, at a fixed cost, a semiconductor chip can be half the size or carry twice the number of transistors. Such innovation improves computing power, while reducing size.

The technology innovation of the past five decades has increased access to information, enabled commerce, and improved business processes. Companies and consumers in all industries have benefitted from such remarkable progress. Students may cite medical technologies, travel applications, fitness sensors, mobile texting/voice communications, e-learning resources, automated vehicles, computerized manufacturing, and retail shopping tools as, among others, common examples.

2. Refer to the Accounting Standards Codification (ASC) and identify the section of the Codification that addresses changes in accounting estimates. Why does this accounting change qualify as a change in estimate and not a change in accounting principle? Be sure to reference the appropriate section of the ASC.

The relevant section in the Accounting Standards Codification (ASC) is 250-10-50-4, Accounting Changes and Error Corrections – Overall Disclosure (Change in Accounting Estimate). Students may identify or quote the section below:

“The effect on income from continuing operations, net income (or other appropriate captions of changes in the applicable net assets or performance indicator), and any related per-share amounts of the current period shall be disclosed for a change in estimate that affects several future periods, such as a change in service lives of depreciable assets. Disclosure of those effects is not necessary for estimates made each period in the ordinary course of accounting for items such as uncollectible accounts or inventory obsolescence; however, disclosure is required if the effect of a change in the estimate is material. When an entity effects a change in estimate by changing an accounting principle, the disclosures required by paragraphs 250-10-50-1 through 50-3 also are required. If a change in estimate does not have a material effect in the period of change but is reasonably certain to have a material effect in later periods, a description of that change in estimate shall be disclosed whenever the financial statements of the period of change are presented.” (ASC 250-10-50-4)

Intel’s change in accounting treatment qualifies as a change in estimate, as they are extending the expected useful economic lives of productive assets. There is no change in accounting depreciation method or other assumptions. As noted in the authoritative guidance, a change in estimate of this type is applied prospectively to future reported income.
3. Identify the financial accounts and elements of Intel’s financial statements that would be affected by this change. Ignore tax effects for purposes of this question.

The change in estimate affects the Balance Sheet, Income Statement, and Statement of Cash Flows. Specifically the excerpt from Intel 2015 (10-K) outlines the relevant accounts (bold emphasis added for instructional purposes):

“Management judgment is required in determining the estimated economic useful lives of our property, plant and equipment, which can materially impact our depreciation expense. Accordingly, at least annually, we evaluate the period over which we expect to recover the economic value of these assets. During the assessment performed in Q4 2015, we considered factors such as the lengthening of the process technology cadence resulting in longer node transitions on both 14nm and 10nm products. With those longer transitions, we added a third product to our 14nm roadmap. We have also increased re-use of machinery and tools across each generation of process technology. As a result, we determined that the useful lives of machinery and equipment in our wafer fabrication facilities should be increased from four to five years. We will account for this as a change in estimate that will be applied prospectively, effective in Q1 2016. This change in depreciable life drives approximately $1.5 billion in lower depreciation expense for 2016. Approximately half of this benefit will increase gross margin (impacting both unit cost and start-up costs), approximately one-fourth will decrease R&D expenses, and the remaining one-fourth will result in lower inventory costs and ending inventory values.” (Intel 2015, 10-K, p 38)

Student responses should also include Property, Plant, and Equipment (net) and related note disclosures. The lower depreciation will also result in smaller difference in net income and operating cash flow, as reported on the Statement of Cash Flows. The question ignores tax effects, as the change is not disclosed.

4. While operating income will increase by approximately 10 percent, why might some investors and analysts view this change as a negative signal about Intel’s business operations?

Operating income would increase due to a change in a non-cash expense. Ignoring tax effects, the change has no effect on cash flow. However, the diminished ability to release new products may signal revenue erosion, weakened price premiums typically assigned to new products, and reduced customer loyalty. Further, extending the life of any productive asset raises the risk of increased maintenance costs, production downtime, machine failure, and potential product quality concerns. All of which may affect cash flow negatively. Also, financial statement users should be mindful of multi-year comparability.

Discussing “trouble” of increasing income allows instructors the opportunity to illustrate how financial statement changes may signal business process weakness or challenges. Doing so allows instructors to emphasize why keen understanding of financial statements, beyond technical accounting procedures, is an invaluable element of respected business acumen.

5. What auditing concerns might the change in accounting estimate related to machine depreciation hold for Intel’s independent public accountant?

Auditors, first and foremost, should consider the broad business impact of slowing innovation at Intel (the pre-
sumed client). Auditors must first understand the business and the effect of changing market forces. Doing so enables audit planning, risk assessment, and audit effectiveness.

From a technical perspective, in terms of specific audit procedures and testing management assertion, even a change in the estimate of the economic lives of productive assets can have far-reaching effects. Some examples that students may raise include the accuracy of depreciation schedules and fixed asset registers.

Valuation of productive assets may also warrant consideration, if revenue realization from semiconductor chips moves to a phase of material decline. Three technology companies (Dell, Hewlett-Packard, and Lenovo) accounted for nearly 50 percent of the company’s revenue in 2015. Auditors should be attentive to the continued business from and collectability of sales to these significant customers.

Last, auditors must carefully review details about critical accounting policies related to property, plant, and equipment to meet management financial reporting obligations (assertion) for financial statement footnotes. Critical accounting policies are typically the first footnote in financial statements and draw reader attention and scrutiny.

6. There are arguments that Moore’s law will continue to hold at the current pace into the indefinite future, while others believe transistor innovation cycles will inevitably slow in the coming decades. Which position do you support? What are the business implications inherent in Moore’s law related to the pace of innovation?

Students should be encouraged to take some position (without engineering knowledge) and consider the business implications of the pace of innovation. Technology is inherent in the success of all businesses. For example, students may assert that Moore’s law is merely a self-fulfilling prophecy – an artificial standard set by Intel and to which the semi-conductor industry holds itself. Unfortunately, as chips shrink below 5nm, estimates suggest that production costs could represent more than two-thirds of Intel’s revenue, and the technology required in very small chips might be less stable (The Economist, 2016). If so, it may make economic sense to abandon Moore’s law. Students supporting Moore’s law may quote those who believe Moore’s law is alive and well, who argue that chipmakers spend billions in pursuit of a better mousetrap, and that promising new designs and materials and revolutionary programming will allow for smaller chips.

Usvyatsky and Pakaluk (2016) note that the 2015 delay in the release of the 10nm effectively marks a departure for the two-year Moore’s law cycle and ask if such a departure “really signals a longer (innovation) cadence, or is it just a one-time hiccup?” As discussed in the questions above, the business implications reach beyond Intel in terms of its customers’ product releases, consumers’ access to new technology, and the reliance of business users on new technologies to improve key value chain activities while reducing costs.

References
Accounting Standards Codification (ASC) 250-10-50-4, Accounting Changes and Error Corrections – Overall Disclosure (Change in Accounting Estimate).
Newcomb, A. (2016, April 20). Intel CEO says reports of the death of Moore’s Law have been greatly exag-
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