

AWASH WITH CASH: WHY ARE CORPORATE SAVINGS SO HIGH?

Companies, which normally borrow other folks' savings in order to invest, have turned thrifty. Even companies enjoying strong profits and cash flow are building cash hoards, reducing debt and buying back their own shares—instead of making investment bets.

—David Wessel, *Wall Street Journal*, July 21, 2005

Two striking changes have taken place in the global financial landscape in recent years. First, reflecting a combination of low investment and—more recently—strong revenues from oil exports, emerging market and oil-exporting countries have become substantial net savers. As a consequence, capital is flowing from emerging markets to industrial countries (notably the United States), the opposite of what would be predicted by economic theory (see Chapter II of the September 2005 *World Economic Outlook*). Second, since the bursting of the equity market bubble in the early 2000s, companies in many industrial countries have moved from their traditional position of borrowing funds to finance their capital expenditures to running financial surpluses that they are now lending to other sectors of the economy.

The large current account surplus in emerging market (and, more recently, oil-producing) countries has been labeled a global “savings glut,” and advanced as a reason why the United States has been able to finance a record high current account deficit at low interest rates (Bernanke, 2005). Yet, the \$1.3 trillion of corporate excess saving (undistributed profits less capital spending) in the Group of Seven (G-7) countries in 2003–04 was more than twice the

size of the accumulated current account surpluses of emerging market and developing countries during those two years. The recent behavior of the corporate sector—which until recently has received much less attention—could therefore be an equally important contributor to the relatively low level of global long-term interest rates at a time of a ballooning U.S. current account deficit (J.P. Morgan, 2005).

Against this background, this chapter assesses the recent behavior of the corporate sector in the G-7 countries. It asks why the strong increase in profits has been used by nonfinancial corporates to acquire financial assets—including a substantial amount of liquid assets (“cash” for short) during 2003–04—or to repay debt, rather than to finance new capital investments or to increase distributions to shareholders through dividends.¹ Specifically, three questions are considered:

- What has been driving the recent increase in excess saving of companies in industrial countries?
- Are there significant cross-country differences in corporate behavior?
- Is the increase in excess saving a temporary or more permanent phenomenon?

In addressing these questions, the chapter explicitly looks at the interaction between real

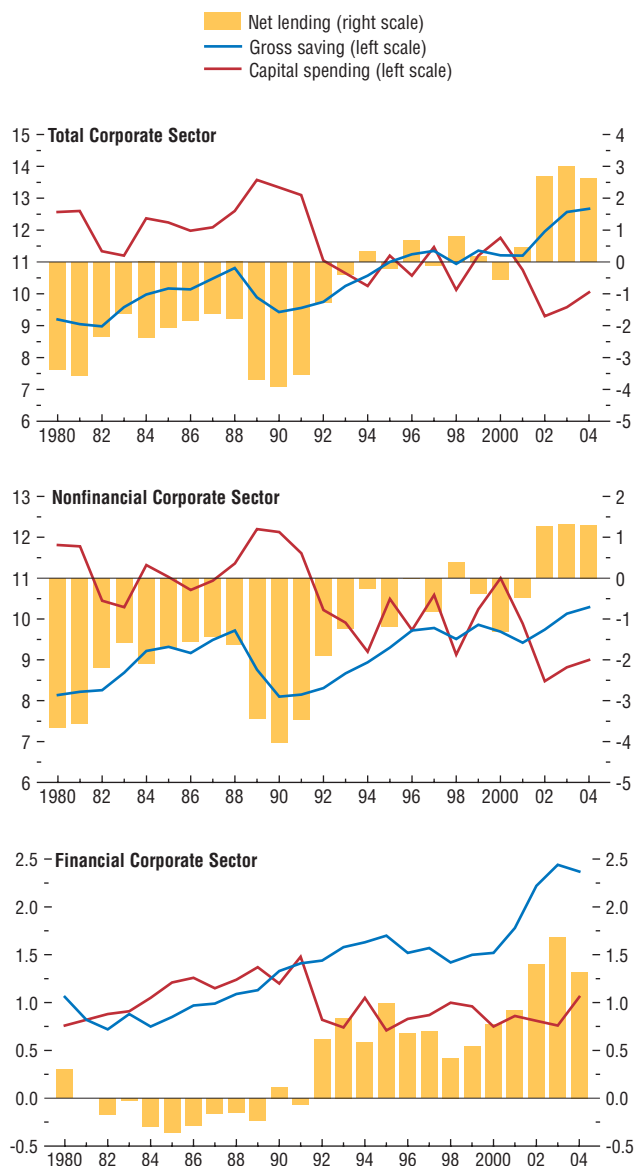
The main authors of this chapter are Roberto Cardarelli and Kenichi Ueda, with support from Vojislav Maksimovic. Ben Sutton provided research assistance.

¹In the chapter, “cash” refers to currency and deposits plus short-term securities (including treasury bills, commercial paper, and certificates of deposits). Data availability does not allow for the inclusion of bank lines of credit, which can be a viable liquidity alternative to cash, especially for profitable firms (Sufi, 2006).

Figure 4.1. Group of Seven (G-7), Excluding Germany: Gross Saving, Capital Spending, and Net Lending/Borrowing¹

(Percent of total GDP)

Total corporate net lending was at a historical high on average during 2002–04, driven by the turnaround in the position of nonfinancial corporates.



Sources: Eurostat; national authorities; and IMF staff calculations.
¹GDP-weighted averages using GDP in U.S. dollars at market exchange rates.

and financial decisions of the corporate sector. For example, are recent financial surpluses simply a residual decision, left after firms have made their capital spending plans, or have they been shaped by balance sheet considerations (e.g., the need to reduce high debt levels) or other factors (including a firm’s desire to insure against the increased volatility it may face in an increasingly globalized corporate environment)?

What Has Been Driving the Increase in Corporate Excess Saving?

Since the 1980s, the corporate sector of the G-7 economies has swung from being a large net borrower of funds from other sectors of the economy to a net lender of funds. Indeed, on average over 2002–04, the excess saving (or “net lending”) of the corporate sector—defined as the difference between undistributed profits (gross saving) and capital spending—was at a historic high of 2½ percent of GDP in the G-7 countries (Figure 4.1). This behavior has been widespread, taking place in economies that have experienced strong economic growth (Canada, the United Kingdom, and the United States) and in those where growth has been relatively weak (Europe and, until recently, Japan). Most of these economies, however, were affected by the boom-and-bust cycle in equity valuations in the late 1990s–early 2000s, which left corporations with high debt levels.

In all of the G-7 countries, higher corporate excess saving (or lower net borrowing in France and Italy) in recent years has partly offset—and in some cases more than balanced—the increase in net borrowing by other sectors of the economy. In the United States—where the current account deficit has widened further in recent years—higher corporate excess saving has offset one-half of the increase in government and household net borrowing, thereby helping to mitigate the impact on the external deficit (see Box 4.1 for a discussion of the link between corporate and household saving).

A number of factors have driven this change from net borrower to net lender status:

Box 4.1. Drawing the Line Between Personal and Corporate Savings

In stark contrast to the secular decline in household saving, corporate saving in the G-7 countries has increased strongly over the last decade, and now accounts for about 70 percent of total private (household plus corporate) saving, compared to 50 percent in the early 1990s (first figure). The strong increase in corporate saving at a time of historically low household saving is a reminder that household and corporate saving decisions are inherently linked. This box discusses this link from two perspectives:

- From economic theory, since households own corporations and should adjust their saving plans—or “pierce the corporate veil”—to offset the saving done by corporates on their behalf (Poterba, 1987; and Auerbach and Hassett, 1991).
- From a definitional standpoint, because there are several questions about the demarcation between household and corporate saving in the national accounts, and several alternatives are available that could be more relevant and appropriate for economic analysis (Gale and Sabelhaus, 1999).

Do Households Pierce the Corporate Veil?

The argument that households may offset changes in corporate saving can be illustrated with a simple example. Suppose a corporation decides to increase its saving—that is, to retain earnings rather than distribute them as dividends—sophisticated shareholders should understand that their net worth has increased (through the increase in the market value of equity) and reduce their savings to re-establish their optimal life-cycle consumption.

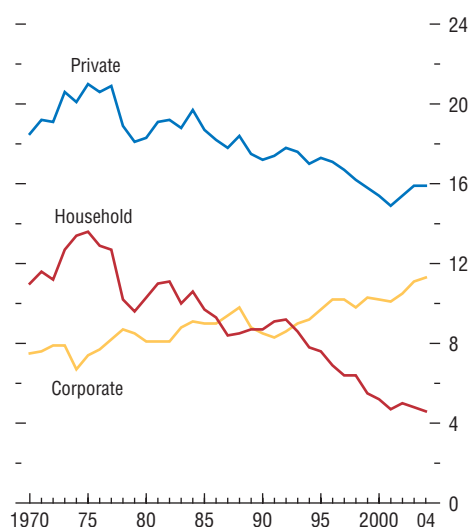
However, a variety of factors related to constraints on consumer and corporate financial behavior may in practice lead to the imperfect substitutability between personal and corporate saving (Bernheim, 2002). In particular:

- Consumers may have a lower marginal propensity to save out of an increase in wealth rather than out of disposable income (which

Note: The main author of this box is Roberto Cardarelli.

Private, Corporate, and Household Gross Saving Ratios in the G-7¹

(Percent of GDP)



Sources: OECD; Eurostat; and national authorities.

¹ GDP-weighted averages using GDP in U.S. dollars at market exchange rates.

would increase if retained earnings were distributed as dividends). For example, they may be liquidity constrained, or they may tend to perceive capital gains as transitory.

- Even in the absence of liquidity constraints and myopic behavior, and with individuals successfully piercing the corporate veil, exogenous shocks that redistribute wealth from individuals to corporations may increase aggregate savings if shareholders have a higher propensity to save than do other consumers.
- The value of the firm may not change dollar-to-dollar with retained earnings, reflecting problems in corporate governance and imperfect observability of new investment projects. For example, if managers invest retained earnings in projects yielding below-market returns, then share values will grow by less than the increase in retained earnings (Jensen, 1986).

Box 4.1 (concluded)

The opposite would happen if retained earnings were to be invested in high-yielding projects that would have been more difficult or costly to finance through financial markets, due to asymmetry of information.

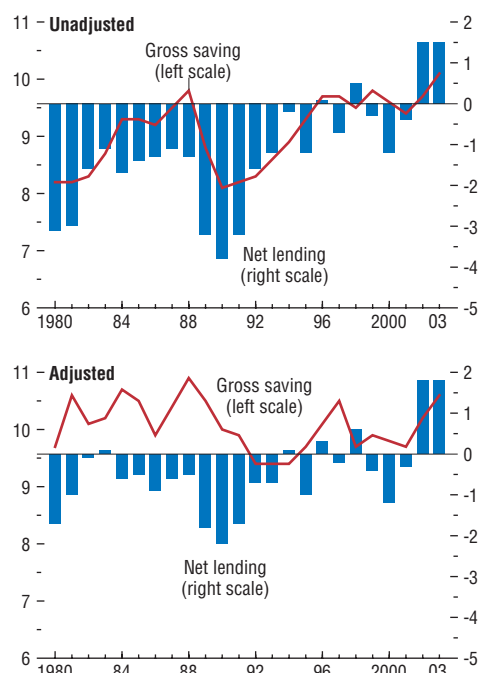
Ultimately, the degree of substitutability between corporate and household saving is an empirical question. The few empirical analyses available tend to show that the “piercing of the corporate veil” is incomplete, which is consistent with the declining trend in private savings shown in the first figure (i.e., corporate saving has not risen sufficiently to completely offset the decline in household saving in recent years). As an example, Poterba (1987) finds that for the United States a \$1 increase in corporate saving is likely to increase total private saving by about \$0.25–0.50, as households reduce their saving by \$0.50–0.75.¹

The Definition of Corporate Savings in the National Accounts

Turning to the definition of corporate saving in the national accounts, two adjustments need to be considered to make the data more economically meaningful. First, retained earnings do not include inflationary gains on nominal debt, which were large during the high inflation decades of the 1970s and 1980s. In particular, as part of nominal interest payments is effectively a repayment of principal (reflecting the inflation-driven erosion of the real value of interest bearing assets), it could be argued that this should be included in corporate saving (Auerbach, 1982; and Poterba, 1987). Making such an adjustment eliminates the upward trend in the G-7 gross corporate saving ratio and cuts the average net borrowing by the G-5 (excluding Germany and

¹Auerbach and Hassett (1991) show that *predictable* changes in dividends and other forms of capital income do not affect consumption, suggesting that no corporate veil exists. However, they also find that wealth-neutral transfers from corporations to individuals would increase aggregate consumption via distributional effects, owing to the heterogeneity in consumption behavior and a lower marginal propensity to consume out of changes in wealth.

Group of Seven (G-7), Excluding Germany and Italy: Nonfinancial Corporate Sector¹
(Percent of GDP)



Sources: Eurostat; national authorities; and IMF staff calculations.
¹GDP-weighted averages using GDP in U.S. dollars at market exchange rates.

Italy) nonfinancial corporations in the 1980s by about one-half (second figure). As discussed in the main text, however, even with this adjustment, nonfinancial corporate sector (NFCs) excess saving in these countries has still been at a historical high during the last two years.

A second adjustment concerns the treatment of pension plans. In the national accounts, all employer-sponsored pension funds are classified as the property of households, so that employer contributions and the interest and dividend earnings are counted as part of household income and thus savings in the year in which they occur. While this treatment seems reasonable for defined contribution plans, it may not be appropriate for defined benefit plans, as

employees do not have the right to all funds that accrue to these plans, but only to the stream of pension benefits deriving from a formula that typically depends on salaries and years of service.

This treatment of pension plans appears to have been particularly important in the 1990s when a strong stock market and high interest rates reduced the contributions companies needed to make in order to meet their defined benefit pension obligations. This contributed negatively to household savings and positively to corporate savings, with Lusardi, Skinner, and Venti (2003) estimating that around 40 percent of the 5 percentage points of GDP fall in the U.S. household saving rate between 1988 and 2000 is explained by the accounting of pension inflows and outflows. More recently, though, the acceleration of employer pension contributions after the decline in the stock market in the early

2000s suggests that defined benefit pension schemes may have been adding to personal saving and subtracting from corporate saving.

Finally, there is one last definitional issue to be considered. While both dividend payments and share repurchases involve channeling funds from the corporate to the household sector, only the former is considered as a form of corporate “dissaving” in the national accounts. The reason is that, consistent with economic theory, transactions that involve exchanging one asset for another (cash against equity) do not alter the amount of income that is available to fund capital accumulation—that is, saving. Still, in the presence of liquidity constraints and/or agency issues discussed above, which prevent households from completely “piercing the corporate veil,” any channeling of resources to the household sector may increase personal consumption and reduce private sector saving.

- First, financial corporations have been registering positive and increasing excess-saving positions since the early 1990s. The developments in the financial sector are related to structural factors that are specific to financial institutions and are thus likely to be part of a longer-term trend (see Box 4.2).
- Second, the nonfinancial corporate sector (NFCS) has turned around more recently to become a net lender (and has largely driven the recent behavior of the overall corporate sector). Part of this turnaround reflects the decline in interest payments that has taken place as nominal interest rates have fallen with inflation. Even after adjusting for inflation, however, the excess-saving position of the NFCS in the G-7 countries in recent years stands out as an unusual phenomenon from a historic perspective.

Given the importance of the NFCS in driving the behavior of the overall corporate sector, and because the behavior of the financial sector appears to be driven by factors specific to that sector, the rest of the chapter focuses on the NFCS.

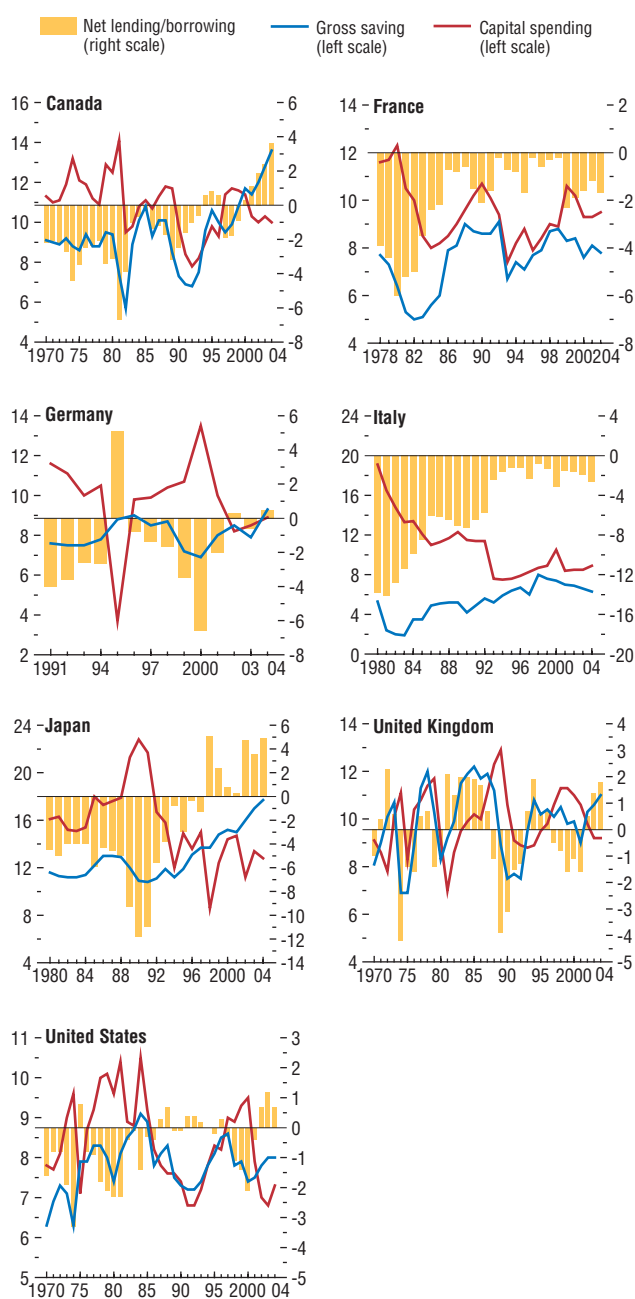
The aggregate trends in the NFCS in the G-7 countries do mask differences across countries (Figure 4.2). While NFCS excess saving has recently reached a historic high in Canada, the United Kingdom, and the United States (and Germany and Japan, when large one-off capital transfers from the government to the nonfinancial corporate sector in 1995 and 1998 are excluded), the nonfinancial corporate sectors in France and Italy have remained net borrowers.²

A range of complex and interrelated factors have likely driven recent NFCS behavior, and

²For Germany, the massive capital transfer reflected the assumption by the federal government of the debt of the *Treuhandanstalt*, the trust fund created to privatize some 8,500 state-owned enterprises in the former German Democratic Republic (East Germany). For Japan, the capital transfer derived from the assumption by the central government of the debt of the Japan Railway Settlement Corporation before its privatization.

Figure 4.2. Nonfinancial Corporate Sector: Gross Saving, Capital Spending, and Net Lending/Borrowing
(Percent of GDP)

Over the recent past, net lending has been especially high in the United States, the United Kingdom, Canada, and in Japan and Germany (excluding the official capital transfers in 1998 and 1995, respectively). Nonfinancial corporates in France and Italy were still in a net borrowing position.



Sources: Eurostat; national authorities; and IMF staff calculations.

these have not only differed in importance over time and between countries, but have also varied between companies and sectors in the same country. The remainder of this section discusses some of the broad factors that appear to explain the recent increase in NFCS net lending, including whether it has largely been driven by real sector developments—profitability and investment decisions—or by financial considerations, such as the desire to repay debt.

A Sustainable Increase in Profits?

One factor behind the increase in NFCS excess saving since 2000 has been the strong rise in profitability (earnings after interest and tax, as a percent of GDP) that has underpinned higher corporate saving despite an increase in dividends paid (Table 4.1). This increase has been particularly striking in Germany and Japan. In Italy, however, profits have declined sharply—indeed, corporate saving has declined in both France and Italy, in the former due to a rise in dividend payments. A closer examination reveals that the increase in profits is mainly due to lower tax and interest payments and, in some countries, to higher profits received from foreign operations, rather than to a rise in gross operating surplus.³ Indeed, gross operating surplus has fallen in France, Italy, and the United Kingdom, while in Japan and the United States—where the NFCS gross operating surplus as a share of GDP has risen sharply over the recent past—the increase does not appear to be out of line with previous cyclical episodes (Figure 4.3). Only in Germany has operating profitability reached a high over the sample period (which starts from the 1990s), reflecting the restructuring that has

³The decline of corporate tax payments since 2000 may be partly the consequence of the economic cycle (tax receipts may have also been reduced by corporates carrying forward the losses from the economic downturn in 2001) but it is also the effect of the general decline in statutory corporate income tax rates in the G-7 economies over the last decade (KPMG, various issues; and European Commission, 2005).

Table 4.1. Nonfinancial Corporate Sector: Change in Selected Variables
(Percent of GDP)

	Gross Operating Surplus (adjusted) ¹ (1)	Property Income ² (2)	Net Interest Paid (3)	Taxes (4)	Profits After Net Interest and Taxes (5 = 1 + 2 - 3 - 4)	Dividends Paid (6)	Gross Savings (7 = 5 - 6)	Capital Spending ³ (8)	Net Lending (9 = 7 - 8)
<i>2004 less 2000</i>									
Canada	...	...	...	...	...	...	1.8	-1.5	3.3
France	-0.2	0.9	-0.1	-0.3	1.1	1.6	-0.5	-1.1	0.6
Germany	1.6	-0.5	-0.4	-0.7	2.2	-0.2	2.5	-4.6	7.1
Italy	-1.5	-0.5	-0.2	0.4	-2.1	-0.9	-1.1	-1.7	0.5
Japan	1.7	0.4	-1.3	—	3.4	0.9	2.5	-1.6	4.1
United Kingdom	-1.2	1.1	—	-0.5	0.4	-0.7	1.1	-1.8	2.9
United States	0.3	-0.1	-0.5	-0.3	1.1	0.4	0.7	-2.1	2.8
G-7 ⁴	0.4	0.3	-0.6	-0.3	1.6	0.9	0.8	-2.2	3.0
<i>2004 less mid-1990s⁵</i>									
Canada	...	...	...	...	...	...	3.6	0.6	2.9
France	-0.3	2.6	-1.5	0.3	3.5	3.1	0.4	1.2	-0.8
Germany	3.3	0.3	-0.6	0.1	4.0	3.3	0.8	-1.4	2.2
Italy	-1.6	—	-1.5	-0.4	0.3	0.3	-0.1	1.2	-1.3
Japan	1.8	0.4	-3.8	-0.5	6.5	1.0	5.6	-0.7	6.3
United Kingdom	-2.1	1.3	0.4	-0.4	-0.8	-1.3	0.5	-0.2	0.7
United States	-0.4	0.3	-0.1	-0.5	0.5	0.6	-0.1	-0.8	0.7
G-7 ⁴	-0.3	0.7	-1.3	-0.4	2.1	1.3	1.0	-0.9	1.9

Sources: Eurostat; national statistical sources; and IMF staff calculations.

¹Gross operating surplus is defined as gross value added less compensation of employees and taxes on production and imports, net of subsidies. Adjusted gross operating surplus adds net rents and current transfers to gross value added, and includes social benefits other than social transfers in kind less social contributions received in compensation of employees.

²Property income includes net reinvested earnings on direct foreign investment, dividends received, and property income attributed to insurance policyholders, and subtracts the adjustment for the change in net equity of households in pension fund reserves.

³Includes gross fixed capital formation, change in inventories, capital transfers, and acquisition of nonfinancial nonproduced assets.

⁴GDP-weighted average.

⁵Mid-1990s is average of 1994, 1995, and 1996 values. Germany data on capital spending were corrected for the 1995 capital transfer referred to in footnote 2.

occurred in the corporate sector mainly through a sharp reduction in wage costs (Schumacher, 2005).⁴

Declining Capital Spending: A “Real” Story?

While higher profits explain part of the rise in NFCS excess saving in recent years, the decline in nominal capital spending explains around three-quarters of the increase in NFCS net lending since 2000 in the G-7 countries. Simply put, firms have been investing a smaller share of

their profits in upgrading and expanding their capital stock. A key question in trying to understand corporate behavior is whether this decline in investment spending is simply a short-term reaction to the high corporate debt levels of the early 2000s.

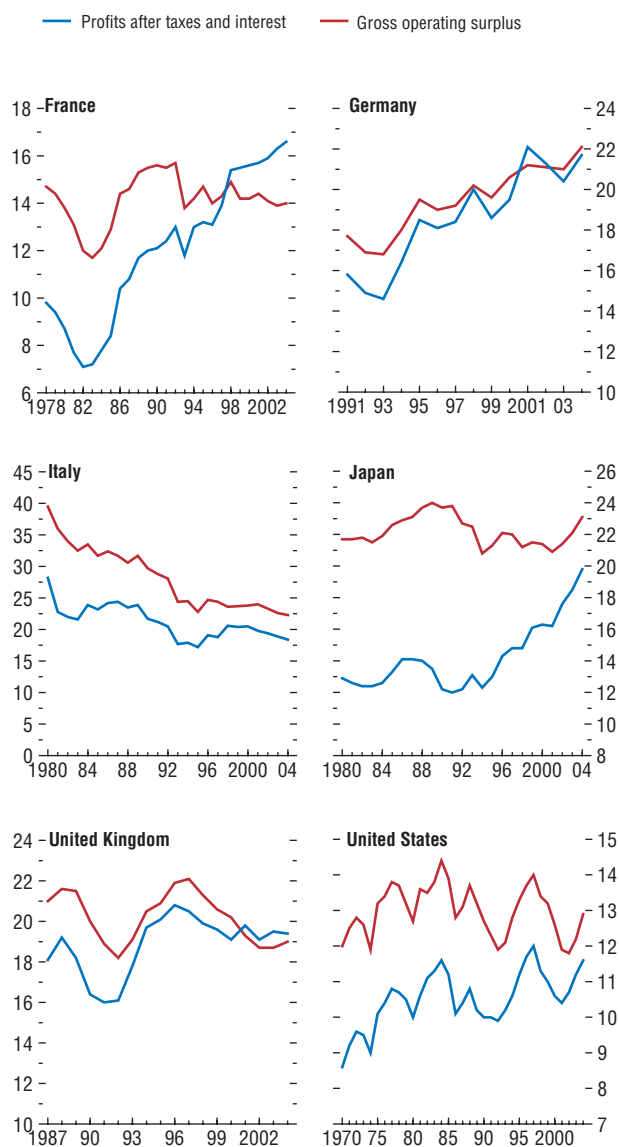
Empirical evidence certainly suggests that high-leverage positions may have a substantial negative impact on investment activity, with a financial accelerator mechanism crimping investment through the decline in firms’ net worth and collateral.⁵ Nevertheless, there has

⁴This does not preclude the possibility that structural factors could boost NFCS operating surpluses going forward in other countries, particularly if strong productivity growth (especially in the United States) and subdued wage developments (especially in European countries) continue to compress unit labor costs (which were flat on average in 2002–04 in the G-7 economies, compared to an average 1½ percent growth rate over the previous seven years).

⁵See “When Bubbles Burst,” Chapter II in the April 2003 *World Economic Outlook*; and Jaeger (2003). At least in some countries, increased caution on capital spending and heavier reliance on internal resources may also reflect the fallout for the cost of capital and market confidence from the corporate accounting and governance scandals of the early 2000s.

Figure 4.3. Nonfinancial Corporate Sector: Gross Operating Surplus and Profits
(Percent of GDP)

While profits (after taxes and interest) were on an upward trend in almost all G-7 countries, gross operating surplus as a share of GDP has increased only in Germany over the last decade.



Sources: Eurostat; national authorities; and IMF staff calculations.

also been a longer-term downward trend in the relative price of capital goods. Firms now have to invest less in nominal terms to achieve a given real investment rate. Indeed, while capital spending measured in current prices has declined in all the G-7 countries since 2000, in real terms the trends have been more variable. The real capital spending of the NFCS has increased in Canada, remained broadly constant in the United Kingdom, and picked up strongly over the last two years in France, Japan, and Italy, where it is almost back to the levels in 2000. Germany and the United States are exceptions, as the fall in the NFCS real investment ratio in these two countries has been more pronounced.⁶ For the G-7 as a whole, about one-half of the decline in the nominal investment ratio is due to the decline in relative prices of capital goods.

Overall, therefore, the subdued level of NFCS nominal capital spending may not simply be a reaction to the “excesses” of the late 1990s.⁷ Indeed, IMF staff estimates suggest that the behavior of real investment ratios in the industrial countries in recent years is relatively well explained by a set of basic economic fundamentals, although real investment ratios are still currently below what an econometric model would

⁶This could be due to the relatively higher indebtedness of German and U.S. nonfinancial corporates at the time of the equity market decline in the early 2000s—between 1995 and 2001 leverage ratios (net debt over internal funds) increased more sharply in Germany and the United States than in the other G-7 economies (with the exception of the United Kingdom). However, the fall in NFCS real investment in these two countries also reflects structural factors: in Germany, the weak profitability of small and medium enterprises that account for most of the domestic investment (IMF, 2006a); in the United States, the 30-year secular decline of investment in structures (in 2004, real investment in equipment and software of the total private sector was back at its 2000 level).

⁷Desai and Goolsbee (2004) show that U.S. firms and sectors that were holding back investment plans in 2004 were not the same as those that invested the most in the late 1990s, suggesting that the cyclical weakness of U.S. business investment does not reflect a capital overhang from the late 1990s.

Box 4.2. Trends in the Financial Sector's Profits and Savings

The financial corporate sector (FCS) in the G-7 countries has been in a financial surplus (i.e., undistributed profits have exceeded capital expenditure) since the early 1990s and, driven by a strong acceleration in undistributed profits, this surplus reached a two-decade high in 2004. Although financial corporations accounted for only one-fourth of the increase in the excess savings of the total (nonfinancial plus financial) G-7 corporate sector between 2000 and 2004, it is important to understand what has been driving the behavior of this sector, given the differences with the nonfinancial corporate sector (see the main text).

As FCS investment levels have been relatively stable in most G-7 countries during the last decade (first figure)—with the exceptions of Canada and Germany where capital spending has declined markedly since the late 1990s—excess saving has primarily been driven by changes in undistributed profits. In turn, with dividends paid by financial corporations relatively flat, or increasing modestly, in most G-7 economies, the main source of the increase in FCS undistributed profits is found in after-tax profits (which accounted for around three-fourths of the increase between 2000 and 2004).¹

This box examines the main factors that underlie the evolution of financial sector profitability in the G-7 countries from the perspective of national accounts data.² At the outset, it should be kept in mind that the financial corporate sector comprises several different types of institutions (primarily banks, pension funds, and insurance companies)

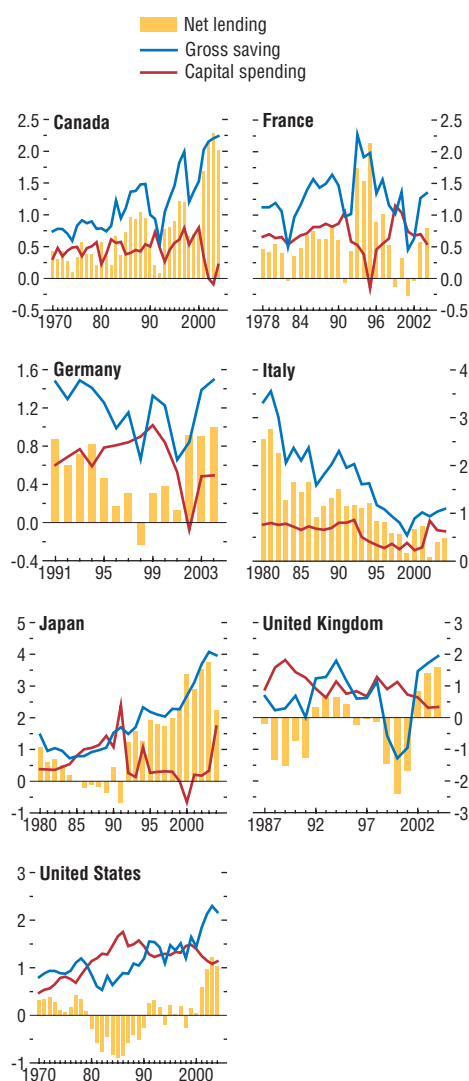
Note: The main authors of this box are Roberto Cardarelli, Daniel Hardy, and Miguel Segoviano.

¹The only exception is France, where undistributed profits have trended downward since the mid-1990s because of the strong increase in dividends paid by financial corporations.

²The national account concepts differ from those used in commercial accounting and in particular they do not take into account valuation changes, such as gains and losses on securities held on investment accounts and credit write-offs.

Financial Corporate Sector: Gross Saving, Capital Spending, and Net Lending/Borrowing

(Percent of GDP; from national accounts)



Sources: Eurostat; national authorities; and IMF staff calculations.

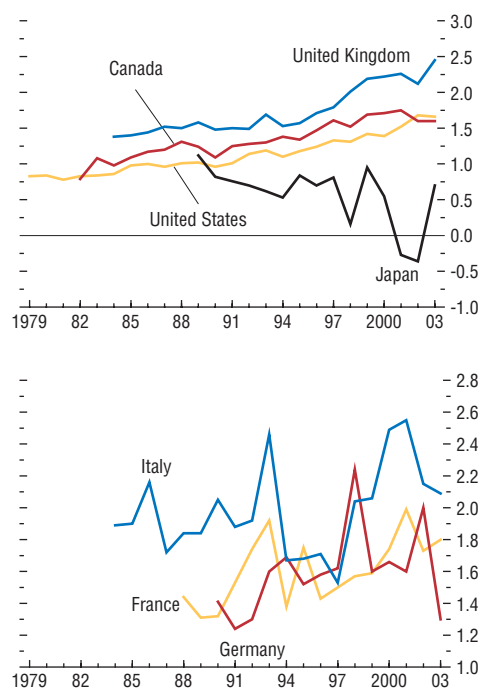
whose behavior is driven by different factors which need to be disentangled to explain sector-wide trends.

Box 4.2 (concluded)*A Longer-Term Perspective*

Even though some general patterns are evident in the financial industry at a global level—including the shift to consumer-driven financial products, within industry consolidation, and a growing demand for asset management and private banking services—there have been considerable differences across G-7 countries in the behavior of financial sector profits over the past two decades. In particular, in France, Japan, and the United States, profits have been on a rising trend, while in Italy they have been falling; while exhibiting some cyclicity, neither Germany nor the United Kingdom shows any clear trend. This cross-country variation may reflect differences in regulatory frameworks and in macroeconomic conditions that have affected both the intensity and the timing with which global patterns have impacted national financial systems.

Among the most important factors explaining FCS developments at the national level are the following:

- The upward trend in Japan FCS profits has been driven mainly by public financial institutions—which have intermediated an increasing volume of funds over the 1990s (Bank of Japan, 2005)—and, to a lesser extent, domestic banks. The high profitability of the public financial institutions is partly explained by the competitive advantage they have enjoyed—including an implicit government guarantee on borrowing and exemptions from paying corporate tax and deposit insurance premiums (Callen and Ostry, 2003). For the domestic banks, the observed upward trend in financial corporate profits in the national accounts appears at odds with the past weakness of the Japanese banking sector, which has been severely affected by credit costs and losses on large equity holdings following the asset prices boom-bust cycle of the late 1980s (IMF, 2005). However, excluding losses from financial operations and provisions against bad loans—as the national accounts statistics do—Japanese banks' profits have been on a modest upward trend since the early 1990s, mainly reflecting falling operating expenses as banks have inten-

Net Income Before Provisions of Banks in Selected G-7 Countries*(Percent of GDP; from financial statements of banks)*

Sources: OECD, *Bank Profitability Database*; and IMF staff calculations.

sified their administrative cost-cutting efforts, particularly in the personnel area.

- The upward trend in the U.S. FCS profits is attributable to banks and especially finance companies, the major suppliers of credit to consumers and businesses (second figure).³ This trend may in part be explained by advances in financial technology, such as

³Finance companies are nonbank financial institutions that provide credit to households—including loans and leases to finance the purchase of consumer goods, such as automobiles, furniture, and household appliances—and businesses—including short- and intermediate-term credit for the purpose of purchasing equipment and motor vehicles and the financing of inventories.

credit scoring systems, and increased borrowing by households in recent years.

- Profits of financial corporations in European countries were generally flat or falling over the 1990s. This, however, seems primarily attributable to developments among nonbank financial institutions (such as the pension and insurance sector) where increased competition compressed margins. On the other hand, bank profitability has been rising relative to GDP since the early 1990s, especially in the United Kingdom. The negative long-term trends may also be related to declining inflation.

More Recent Developments

In all countries, profits of the financial corporate sector have accelerated strongly since the early 2000s. Part of the reason is cyclical as net income tends to rise during upswings, reflecting a pickup in lending—which increases both inter-

est and noninterest income, mainly from fees associated with the origination, sales, and servicing of financial products—and the steep yield curve in the initial stages of recovery that allows banks to increase their net interest income.⁴ In addition, there has been a tendency to distribute a smaller share of these profits through dividends (particularly in European countries), partly reflecting greater pressure from markets for financial institutions to improve their ratings by strengthening their capital bases (see IMF, 2006b).

⁴This effect has been less important for Japan, where the yield curve has remained relatively flat since 2000. Moreover, in several of the G-7 countries the yield curve has been flattening since early 2004, suggesting that this effect is not going to play a role going forward. It should also be noted that changes in the yield curve may have now a more muted impact on banks' profitability compared to the past, as financial innovation has reduced banks' reliance on interest margins.

predict.⁸ This result seems inconsistent with the view that there has been a regime change in the underlying capital accumulation process of industrial countries in recent years, and it also suggests that at least some of the reduction in nominal capital spending is unlikely to be reversed.⁹

Paying Down Debt

Faced with unexpectedly high debt ratios after the fall of equity valuations in the early 2000s, some firms have clearly made an explicit decision to use profits to repay debt (bank loans and corporate bonds) rather than reinvest them in their

businesses or distribute them to shareholders as dividends. In addition, concerns about the vulnerability to changes in financial market conditions and about the access to credit in an adverse economic environment have induced firms to reduce their dependence on external financing and to rely more on internally generated funds.

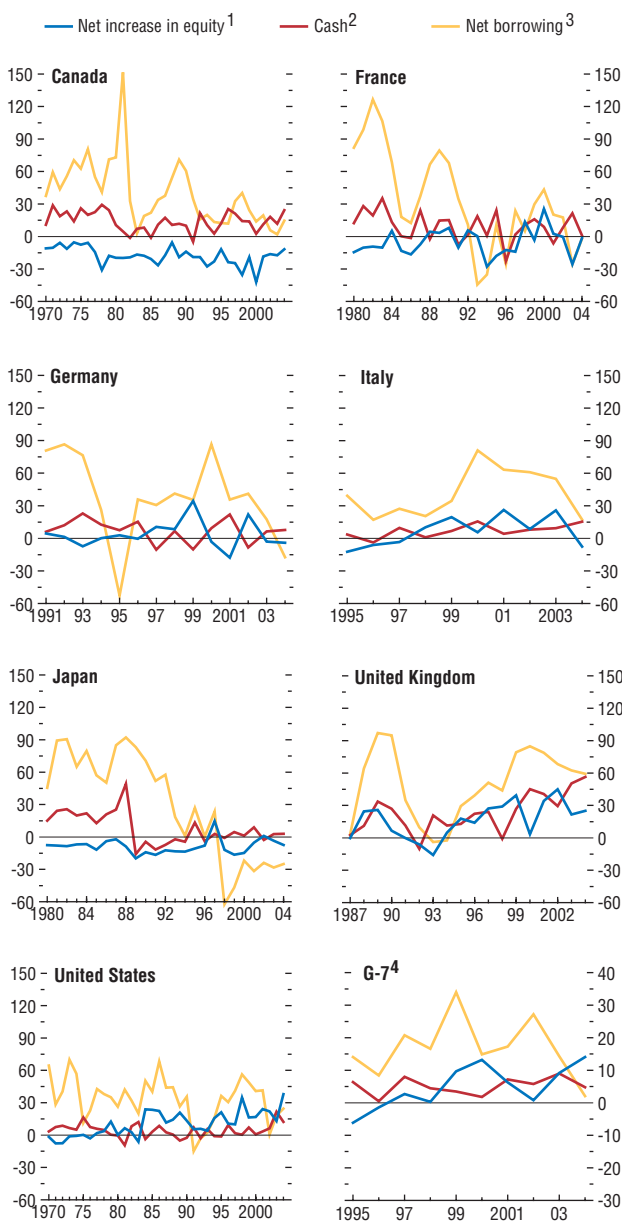
Net borrowing by the NFCS has declined in all the G-7 countries since the late 1990s although only in Japan and, more recently, in France and Germany have companies, in aggregate, actually been repaying debt (Figure 4.4). Indeed, only in Canada and Japan is corporate leverage substantially below its late 1990s levels, although firms

⁸Estimated on annual data. The set of explanatory variables includes the first lag of the gross fixed investment ratio; real per capita output growth; the cost of capital, measured as the ratio of the real interest rate to the relative price of capital; and the elderly and youth dependency ratios. The dynamic panel model was estimated using the Generalized Method of Moments estimator with robust errors. See “Global Imbalances: A Saving and Investment Perspective,” Chapter II in the September 2005 *World Economic Outlook*, for a more detailed description.

⁹Technological progress will likely continue to lower the prices of capital goods, especially in information technology (IT) capital, and this in turn will help to boost the volume of capital spending. However, as the IT industry has matured—and most companies now need to upgrade their existing stock of IT technology rather than building it from scratch—the response of corporate spending on IT capital for a given change in prices is likely to be more muted compared to the 1990s (Doms, 2005). This suggests that nominal spending on IT capital may not increase as quickly as it did in the late 1990s, and that real spending in IT goods may also grow at more modest rates.

Figure 4.4. Nonfinancial Corporate Sector: Financial Accounts, Selected Variables
(Percent of gross saving)

Net borrowing has fallen sharply in almost all G-7 countries since the early 2000s. The accumulation of equities has been on an upward trend in several G-7 economies since the early 1990s, while cash holdings have accelerated more recently, especially in the United States, the United Kingdom, and Canada.



in a number of G-7 countries have taken advantage of low interest rates to lengthen the maturity profile of their debt, and the share of the short-term to total NFCS debt has declined noticeably in almost all of the G-7 countries.¹⁰ Debt repayment, however, has not been the primary reason for companies' excess savings. Rather, for the G-7 as a group, nonfinancial corporations have tended to invest their excess cash flow primarily into equities and cash, rather than repaying debt (Figure 4.5).

Accumulating Equities

In Italy (until 2004), the United Kingdom, and the United States, the nonfinancial corporate sector has been accumulating substantial amounts of equity in recent years. This equity accumulation reflects higher (net) direct investment abroad and/or the repurchase of equities from the household and government sectors. While the lack of sufficiently detailed flow of funds data for all the G-7 countries prevents drawing broad conclusions, some insights on the relative importance on these two types of financial transactions can be drawn for the United Kingdom and the United States where data is available.

- Share repurchasing has been very important in the United States, in particular, where non-financial corporates have retired an extraordinary amount of equity since the late 1990s, both in cash-financed mergers and through share repurchase programs.¹¹

¹⁰At the same time, firm-level data discussed in the next section show that, over the recent past, at least some firms have financed "cash hoarding" with external financing, as they took advantage of favorable financial market conditions (low interest rates, tight credit spreads, and rising equity prices) to accumulate cash buffers.

¹¹Share repurchasing can be interpreted as a more tax-effective way of transferring resources to the household sector, as it subjects individual investors to capital gains taxes that are usually lower than dividend taxes. Surveys of U.S. financial executives, however, suggest that managers believe investors have a strong preference for dividends and tend to repurchase shares when facing temporary earning increases or lack of good investment opportunities, rather than as an alternative to dividend payments (Brav and others, 2003). The increased reliance

- The (net) purchase of equities from the rest of the world shows that nonfinancial corporations in the United Kingdom and the United States have been pursuing a strategy of expansion through acquiring assets abroad, including in emerging markets. Rather than financing new investment at home, part of the internal funds available to nonfinancial corporations in these two countries has been used to purchase existing capital equipment abroad. For the United States, if net direct investment abroad by nonfinancial corporations is added to their domestic capital spending, nominal total NFCS capital spending in 2004 is broadly at the same level as in the late 1990s. This suggests that one factor behind the relative weakness of domestic capital spending by nonfinancial corporations in the United States in recent years is their increased financial investment overseas.

Why Are Firms Accumulating So Much Cash?

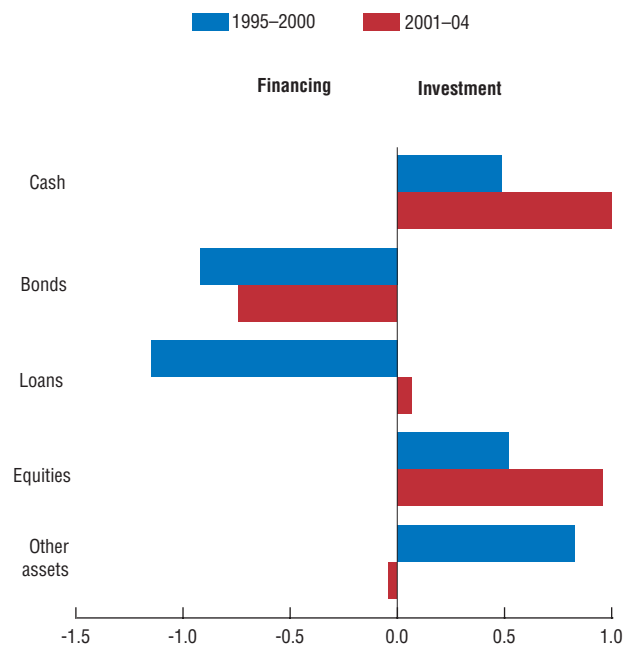
Companies in Canada, Japan, the United States, and, particularly, the United Kingdom have increased their cash holdings in recent years. This cash accumulation is more difficult to rationalize than either debt repayment or equity accumulation: why would firms want to hold so much cash on their balance sheets? Firm-level data for listed, nonfinancial companies in the G-7 countries provide the following insights into this cash accumulation.¹²

on share repurchasing in the United States may also reflect the record number of stock options issued in the 1990s, which provided managers with a strong incentive to repurchase their firm's shares in order to maintain high stock prices (Weisbenner, 2000).

¹²The sample of firms is from the Worldscope database and covers about 10,000 nonfinancial listed companies in the G-7 countries in 2004. Differences in accounting principles and in sample coverage prevent an exact mapping between the trends in the national accounts and firm-level data. However, aggregating cash and saving at the firm level obtains broadly the same patterns shown by national accounts—specifically, a sharp increase in undistributed profits as a share of revenues from sales, and of cash accumulation as a share of undistributed profits over the recent past, particularly in Canada, the United Kingdom, and the United States.

Figure 4.5. Financial Transactions: Nonfinancial Corporate Sector of the G-7 Countries¹
(Average, percent of GDP)

Nonfinancial corporates primarily invested in equities and cash on average during the 2001–04 period.

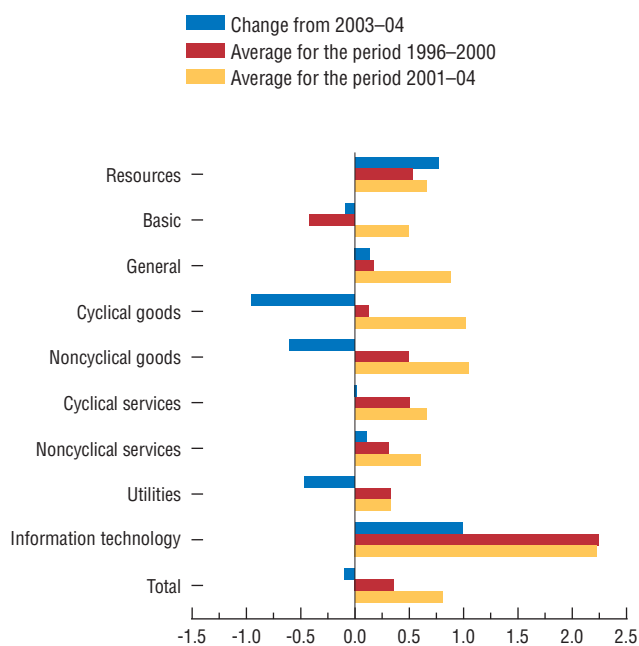


Sources: Eurostat; national authorities; and IMF staff calculations.

¹GDP-weighted averages using GDP in U.S. dollars at market exchange rates.

Figure 4.6. Cash Accumulation in the G-7 Countries by Industry¹
(Percent of total assets)

Cash accumulation has been particularly strong in the information technology (IT) sector in recent years. In 2004, only the IT and resource sectors have significantly accelerated the accumulation of cash holdings.



Sources: Thomson Worldscope database; and IMF staff calculations.

¹ Industry averages calculated as the sum of cash accumulation for the stated period divided by the sum of total assets for the same period.

- Cash accumulation (as a share of total assets) was more than twice as high during 2001–04 than 1996–2000, with all sectors increasing their cash accumulation (Figure 4.6). However, aggregate corporate cash accumulation declined modestly in 2004 as continued increases in the information technology (IT) and resources sectors were more than offset by declines in other sectors, particularly utilities and cyclical goods. This suggests that while there were common factors behind the increase in corporate cash holdings in the early 2000s, recent behavior has been driven by industry-specific factors, particularly stronger profits in resource companies following the upsurge in commodity prices (which likely continued in 2005).

- As well as differences across industries, the distribution of cash accumulation across firms is very unequal in dollar terms, with the median increase in cash among the largest firms being eight times larger than among the mid-size firms in the sample (Table 4.2). Further, the accumulation of cash is far from universal—about 40 percent of the firms in the sample actually reduced their cash balances during 2001–04. Nevertheless, while the biggest 100 firms in the sample accounted for about 40 percent of total cash accumulation on average between 2001 and 2004, they also accounted for 40 percent of total sales, indicating that cash accumulation has been relatively evenly distributed once firm size is accounted for. This stands in contrast to the 1996–2000 period when cash accumulation was driven primarily by the smallest firms, suggesting that some of the factors underlying cash accumulation may have changed over these two periods.

The economics literature, summarized in Opler and others (1999), presents two views on corporate cash holdings. The first is that cash holdings are simply a sideshow—they change mechanically with a firm’s excess cash flow (retained earnings less capital expenditure). The alternative view is that, in an attempt to maximize shareholder wealth, cash holdings are set at

Table 4.2. Group of Seven (G-7) Countries: Cash Accumulation, by Size of Firm's Sales

Range of Sales (Billions of U.S. dollars) ¹	Number of Firms	Share of Total Change in Cash (Percent)	Median Change in Cash (Millions of U.S. dollars)	90th Percentile Change in Cash (Millions of U.S. dollars)
<i>Average 1996–2000</i>				
0.0–3.1	3,075	75.8	0	29
3.2–9.3	302	11.9	3	224
9.4–19.6	119	20.7	10	517
20.4–48.0	52	14.8	44	1,016
49.6–172.0	19	–23.0	123	2,708
<i>Average 2001–2004</i>				
0.0–3.1	5,044	23.5	1	36
3.1–10.0	508	19.4	14	303
10.0–24.8	184	14.0	34	713
24.8–57.3	76	19.7	208	1,895
59.3–252.5	27	23.3	371	5,766

Source: IMF staff calculations based on Worldscope data.

¹Groups are obtained by ranking each firm in the G-7 by their sales every year, and then dividing total yearly sales by 5. The top (fifth) group is thus formed by the biggest *N* firms that together account for one-fifth of total sales, the fourth group by those immediately smallest *N* firms that accounted for another fifth of total sales, and so on.

a level that equates the marginal cost and benefit. While the cost of holding liquidity is the lower expected return, the benefits derive from the reduced probability of being short of financing if profits fail to meet expectations, and, therefore, being forced to cut investment plans and/or dividend payments or having to raise costly external finance.

The accumulation of cash in recent years may therefore be related to strong profit growth, but also reflects factors that have changed the expected benefits or costs of cash holdings, including lower interest rates; higher sales (and profit) volatility as firms are now operating in a more uncertain environment (Figure 4.7);¹³ and the larger share of intangible assets in corporate balance sheets (firms with more intangible assets are likely to hold more cash given the higher cost of external finance for these type of uncolla-

terized and more volatile assets; see Passov, 2003).

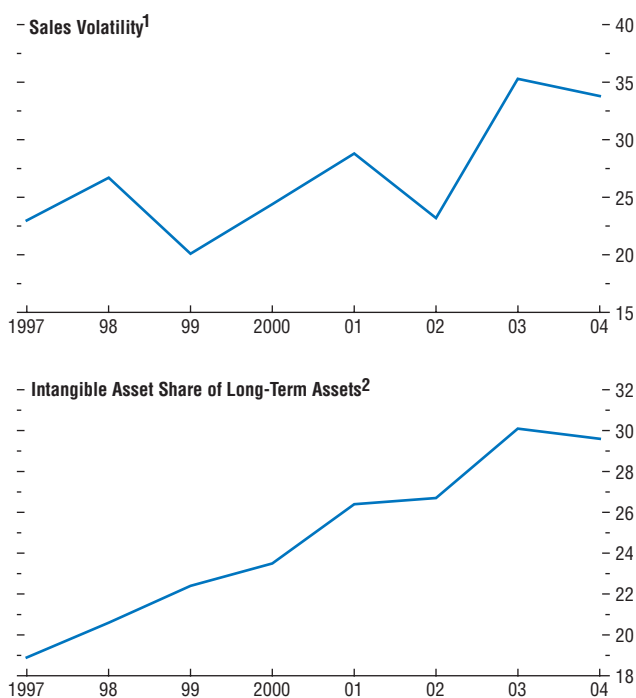
Indeed, firms that have accumulated more cash relative to their total assets (those in the top quartile of the increase in cash over total assets distribution) tend to have more volatile sales, a higher share of intangible assets, and higher Tobin's *q* (which proxies for higher expected profitable investment opportunities; see Appendix 4.1). At the same time, however, cash-rich firms are also the ones with larger excess cash flow (the difference between gross savings and capital spending), suggesting that strong profitability has also played a role.¹⁴ If cash accumulation has been driven by changes in the marginal cost and benefits of holding liquid assets rather than simply excess cash flows, the variables described earlier should be able to explain a significant share of the increase in

¹³Comin and Philippon (2006) show an increase in firm volatility in the United States since the mid 1950s, and attribute it to increased competition spurred by globalization.

¹⁴Firms with the highest increase in cash relative to their total assets also had relatively higher access to external financing, lending some support to the view that at least some firms may have been taking advantage of temporarily advantageous conditions for external financing to accumulate cash holdings that will be used as a buffer when external capital is more expensive (Greenwood, 2005). Also, on average over 2001–04, cash-rich firms tend to have smaller net assets from acquisitions, contrary to the view that associates the recent increase in cash accumulation with the resurgence of mergers and acquisition ventures. A possible explanation is that if the threat of takeovers increases with a firm's liquidity position, companies that operate in sectors with relatively strong mergers and acquisition activity have an incentive to hold less, not more, cash.

Figure 4.7. Sales Volatility and Intangible Assets in the G-7 Countries

Over the last decade, sales volatility and the share of intangible assets have increased in the sample of firms considered.



Sources: Thomson Analytics Worldscope database; and IMF staff calculations.
¹Market capitalization-weighted average of five-year rolling standard deviation of growth rate of firms' sales.
²Market capitalization-weighted average of the stock of intangible assets in percent of long-term assets (defined as total assets minus assets with maturity of one year or less).

cash holdings over the recent period. The econometric analysis—shown in Appendix 4.1—indicates that:¹⁵

- On average for the 2001–04 period, the coefficients of industry sales volatility, the industry share of intangibles assets, and industry Tobin's *q* all have the expected signs and are statistically significant determinants of changes in cash relative to total assets among G-7 firms.
- A 1 percent increase in the intangible asset share of a company or a 1 standard deviation increase in sales volatility would induce a 5 percent increase in the share of savings invested in cash.¹⁶ Together, these two variables explain around one-third of the increase in cash over total assets on average in 2001–04.
- The regression covering the whole period, 1996–2004, also shows that the accumulation of cash balances accelerated especially in those sectors with higher volatility of sales. All in all, the econometric results provide some important insights into why corporates have increased their cash holdings in recent years, yet a good deal of the buildup remains unexplained, suggesting that country- and firm-specific factors have played an important role.

One commonly cited factor, for example, is that some companies have large unfunded pension liabilities. The plunge in equity valuations in the early 2000s and declining interest rates have caused the funded status of corporate-sponsored defined benefit pension plans to deteriorate significantly. In the United States, defined benefit pension plans sponsored by the S&P 500 firms moved from a \$200 billion surplus in 2000 to a \$200 billion deficit at end-2004 (see Zion

¹⁵The econometric analysis is based on a cross-section regression, which explains the average relationship between the increase in cash over total assets and the explanatory variables in the most recent period, 2001–04; and a panel regression, which captures the possible changes in this relationship over the whole sample period, 1996–2004.

¹⁶The impact on the share of retained earnings invested in cash is derived from the regression coefficients using the average ratio between retained earnings and total assets in the G-7 countries over 2001–04.

Table 4.3. Defined Benefits Corporate Pension Plans: Assets Over Liabilities¹

	1999	2002	2003	2004
Canada	0.86	0.83
France	0.47
Germany	0.36	0.51
Japan	0.58	0.59
United Kingdom	0.77	0.80
United States	1.31	0.82	0.89	0.90

Sources: Watson Wyatt, 2006; and Watson Wyatt *Insider*, various issues.

¹Pension liabilities are defined as the actuarial present value of benefit obligations. A ratio higher than 1 means that the pension schemes are overfunded. Positions are as of December 31 of each year.

and Carcache, 2005). Recent estimates (Watson Wyatt, 2006) suggest that corporate defined benefit pension plans are significantly underfunded in all the G-7 countries, but particularly in Europe (Table 4.3).¹⁷ Firms in these countries may therefore be building up cash holdings as a precaution against the need to contribute larger-than-anticipated amounts into their pension plans—for example, by purchasing long-term assets.¹⁸ Unfortunately, company-specific data is not available to test this within the econometric framework.

Are Current Trends in Corporate Excess Saving Sustainable?

As discussed in the previous section, excess saving in corporate sectors of G-7 countries has been at a historic high in recent years. This has helped offset some of the decline in household

and government saving, and has contributed to the relatively low level of long-term interest rates. A key question going forward is whether this increase in excess saving is largely a temporary phenomenon, and therefore likely to be reversed over the next few years, or whether it represents a more fundamental change in corporate behavior. Some of the factors that will determine this are discussed below.

- *The profit outlook.* It is difficult to argue that there has been a significant and permanent increase in the profitability of the nonfinancial corporate sector in all the G-7 countries in recent years. Rather, NFCS profits have greatly benefited from current low interest rates and reductions in corporate tax payments. Both of these are likely to reverse to some degree. Monetary policy will likely tighten going forward, raising interest payments, although the decreased reliance on short-term debt and the decline in debt ratios should help limit the increase. Further, earlier corporate tax cuts, at least in some countries, may need to be withdrawn under increasing pressures on government budget positions (although cross-country tax competition may limit this).
- *Will domestic investment pick up?* With capacity utilization increasing in some countries, it seems reasonable to expect that investment will strengthen going forward. Nevertheless, the ongoing decline in the relative price of capital goods means that nominal investment ratios are likely to remain below those seen in previous cycles.¹⁹

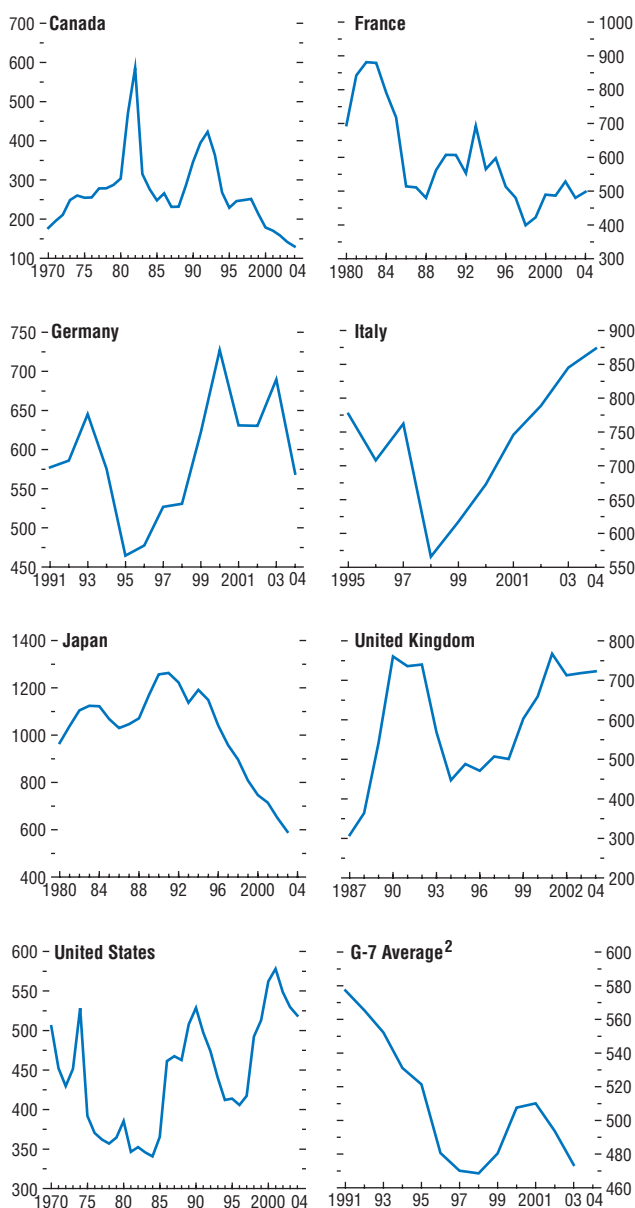
¹⁷This does not mean that European countries have a more serious problem of underfunding, however, as company-sponsored defined benefit pension plans play a more limited role in the overall pension systems of these countries compared to the other G-7 countries (see IMF, 2004).

¹⁸In the United Kingdom—where NFCS cash holdings have increased the most over the recent past—changes in the minimum funding requirement for occupational defined benefit pension plans were introduced in 2005 that aim at eliminating the underfunding over a 10-year time span. Based on estimates from the U.K. Pension Regulator, this will require £130 billion additional contributions into company pension schemes, imposing a substantial burden on the pension contribution paid by employers, which has already increased sharply over the last four years—in 2004 they stood at approximately £38 billion, almost doubling the £21 billion paid in 2000.

¹⁹Legislative and regulatory measures recently implemented in several industrial countries to improve corporate governance may have a positive effect on corporate and investor confidence and, therefore, capital spending. These measures, however, may also reduce the valuation discount that shareholders apply to firms with high cash balances and lower dividend payouts, as stronger corporate governance reduces the risk of overinvestment in negative yield projects or outright stealing from entrenched managers (see Kalcheva and Lins, 2005).

Figure 4.8. Nonfinancial Corporate Sector Debt¹
(Percent of gross saving)

Only in Japan and Canada is corporate debt (as a ratio to internal funds) significantly below its mid-1990s level.



Sources: Eurostat; national authorities; and IMF staff calculations.

¹Net loans and long-term securities other than shares (liabilities minus assets).

²GDP-weighted averages using GDP in U.S. dollars at market exchange rates.

- Has the process of deleveraging been completed?* It is clearly difficult to know whether the deleveraging process has ended. Substantial progress has been made in reducing corporate debt in some countries, and an international survey by Merrill Lynch Global Fund Managers shows that investors have become much less worried about companies leverage ratios. Indeed, only 18 percent of the investors questioned in the most recent survey wanted companies to improve their balance sheets, compared to 31 percent at the end of 2003 and 55 percent at the end of 2002. Nevertheless, even if low interest rates have helped nonfinancial corporations to extend their average debt maturity, only in Canada and Japan is the ratio of debt to undistributed profits (internal funds) below the levels seen in the late 1990s (Figure 4.8). At the same time, the lack of comprehensive data on off-balance-sheet liabilities makes it impossible to assess the complete corporate credit picture. In particular, unfunded pension liabilities are excluded from reported balance sheet leverage, and consequently debt ratios could be severely understated.
- Investment in equities is here to stay.* There is no reason to expect the accumulation of equities by corporates—through either share repurchasing or investing abroad—to come to a halt. Indeed, given ongoing globalization and the opportunities that companies in industrial countries enjoy in emerging markets, the pace of overseas asset acquisition may actually increase.
- Will firms want to continue to hold cash?* While the upward trend in both sales volatility and the share of intangible assets at the firm level may have increased the desired amount of cash balances, these two trends can only partially explain the increase in cash holdings over the last four years. Other factors suggest this is a relatively temporary phenomenon. In particular, the fact that cash accumulation during 2004 increased solely in the IT and resources sectors—where profits were strong—suggests this process may now be tailing off.

In sum, while it is clearly very difficult to predict the behavior of the corporate sector going forward, the most likely scenario is that excess savings will decline from current levels over the next few years if investment picks up, some of the factors that have driven recent profits wane, or investors put less pressure on corporations to reduce their debt levels. Nevertheless, a number of structural changes—including increased volatility in the operating environment, a desire to increase investment overseas, and the need to finance off-balance-sheet liabilities—means that corporate excess saving may remain more elevated than during the 1990s.

Conclusions

The corporate sector in the G-7 countries has moved from being a net borrower to a substantial net saver in recent years. This has followed the earlier move by emerging market countries to a net saver status following the financial crises of the late 1990s. Taken together, these developments have substantially altered the financial landscape of the global economy—two sectors that have traditionally been sources of demand for financing are now lending to other countries/sectors. These changes in behavior are one factor behind the relatively low level of global long-term interest rates at present.

With regard to the nonfinancial corporate sector, one commonly held view is that the recent increase in net lending is mainly a reaction to the excess debt and physical capital that was accumulated in the 1990s, and it is therefore temporary. Once these excesses have been worked out, the corporate sector will again become a net borrower, and as this occurs, it will put upward pressure on long-term interest rates. This chapter, however, has suggested that the story is not as simple as this—indeed, only in Canada and Japan has the reduction in corporate debt been substantial enough to be consistent with this story. Other factors, some cyclical and some structural, have also played a role, although their importance has differed across countries. In particular:

- Profits have been strong, primarily because of low interest rates and a generalized reduction of corporate tax payments, while operating profits do not appear to be abnormally high, despite their recent acceleration in a few countries. If companies view these factors as unlikely to be sustained going forward, they may hold back on investment plans and instead boost their savings;
- Ongoing technological change has reduced the relative price of capital goods, and reduced the nominal spending needed to achieve a given *volume* of capital;
- Companies have increased their purchases of assets abroad, shifting resources from domestic capital accumulation; and
- Companies have increased their desired cash holdings, partly as a reaction to the more uncertain operating environment they face, the increasing role of intangible assets in the knowledge-based economy, and possibly the uncertainties associated with how they will be asked to meet currently unfunded pension liabilities.

Judging the relative weight of all these factors in explaining the current high level of corporate excess saving is clearly a difficult task. It does, however, seem reasonable to conclude that the corporate sector in industrial countries will not return to the large negative financing positions of the past—paralleling to some degree the behavior of emerging market economies, where current account surpluses have proved more long-lasting than originally projected. Nevertheless, excess savings are also unlikely to be sustained at current record levels going forward, particularly if the degree of slack in the advanced economies continues to narrow—thereby encouraging stronger investment spending—or corporate profitability weakens. Thus, high corporate saving should not be relied on to keep longer-term interest rates low in the future. Indeed, without some increase in household and government saving in the coming years, changing corporate behavior will likely start to put upward pressure on interest rates, and could exacerbate the current pattern of global imbal-

ances if it lowered total private saving in deficit countries.

Appendix 4.1. Econometric Methodology

The main authors of this appendix are Roberto Cardarelli and Kenichi Ueda.

To investigate the accumulation of liquid assets (or “cash”) of nonfinancial corporations in the G-7 economies, firm-level data were used from the Worldscope database.²⁰ After screening for outliers, the sample covered about 10,000 nonfinancial listed companies in the G-7 countries in 2004. About 4,000 of these are from the United States, 3,000 from Japan, 1,000 from the United Kingdom, 700 from Canada, 500 from France, 400 from Germany, and 200 from Italy. Each country’s share of total (G-7) revenues from sales is approximately equal to its share of total GDP, suggesting that each country is adequately represented in the sample. While data are available since the 1980s, only for the United States is there a sufficiently large number of firms before the mid-1990s. Therefore, this chapter restricts the analysis to the 1996–2004 period (in 1996, the sample contains about 3,500 firms).

Using firm-level data, the chapter relates cash accumulation to a series of variables that are generally believed to affect the marginal costs and benefits of holding cash (the expected sign of the causality direction is indicated in parenthesis):²¹

- Size/age of firms (–/+); bigger/older firms should have easier or cheaper access to external financing, so they should hold less cash. However, if cash accumulation is simply a residual, larger and mature firms should have more cash as they are more likely to generate cash flow in excess of profitable investment opportunities.

- Volatility of sales (+); firms with more uncertain sales revenues (e.g., those in a more competitive industry) should invest more in liquidity because (all other things being equal) they are more likely to suffer from cash shortages.
- Tobin’s q (+); firms with a higher Tobin’s q (more profitable investment opportunities) should accumulate more cash, as cash shortages would mean these firms have to forgo high-return projects.
- Intangible asset share of total fixed assets (+); firms characterized by a larger share of intangible assets (e.g., patents and goodwill) should hold more cash, given the higher cost of external finance for these type of uncollateralizable assets.
- Net assets from acquisition (–/+); firms that operate in sectors and countries with a relatively high level of merger and acquisition activity should hold more cash, as cash-rich firms are more likely to make acquisitions. However, if the threat of takeovers increases with a firm’s liquidity position, this could have a negative effect on cash holdings.

In investigating these determinants empirically, both descriptive statistics and regression analysis are used in the chapter.

First, firms that have invested in cash the most, on average over 2001–04 (those in the top quartile of the distribution of the change in cash—Increase in Cash and Short-Term Investments in Worldscope (WS), with code 04851—relative to firm’s total assets, WS 02999) are compared to those that invested in cash the least (those in the bottom quartile of the same distribution), in order to uncover systematic relations between cash accumulation and key firms’ characteristics. In particular, the following variables were considered:

- Firm size, captured by the logarithm of revenues from sales (WS 01001) and logarithm of total assets.

²⁰Income and balance sheet information are entered in Worldscope for each listed stock. As the same firm may be listed in several markets and it may have several types of listed stocks in the same market, information on the same firm may be entered several times. To avoid duplications, only balance sheet information associated with the most widely traded stock listed in the major home stock exchange is picked for each company. Liquid assets or “cash” is here defined as cash and short-term investments, including treasury bills, commercial paper, and certificates of deposits.

²¹See, for example, Opler and others (1999); and Almeida, Campello, and Weisbach (2002).

- Excess cash flows, defined as saving (net income, WS 04001, plus depreciation, WS 04051, less dividends paid, WS 04551) less capital expenditure (WS 04601), divided by total assets.
- Volatility of sales, defined as the five-year rolling standard deviation of sales growth.
- Tobin's q , defined as (market capitalization, WS 08001 + book value of total debt, WS 03255) divided by total assets.
- Intangible assets (WS 02649) divided by long-term assets (total assets less short-term assets—that is, assets expected to be realized, sold, or consumed within a year, WS 02201).
- Net assets from acquisition (WS 04355, from the cash flow statement) divided by total sources of cash (cash from operating activities, external financing, and decrease of investments).
- Net cash flow from financing (WS 04890) divided by total assets.
- Stock of cash (WS 02001) divided by total assets.

Both the univariate comparison of firms' characteristics by quartiles of cash accumulation and the regression analysis below are restricted to firms with positive net income, as the relationship between cash holdings and the explanatory factors listed above would be irrelevant for firms that do not have a chance to save.

For all firms with increases in cash over total assets in the same quartile, Table 4.4 shows the weighted averages, median, and 90th percentile of the variables described above. The last column reports the p -value of a t -test on the difference of averages of the first and fourth quartiles. The table shows that firms in the top quartile of the cash distribution significantly differ from those in the lowest quartile because they tend to be relatively smaller, have more volatile sales (although in median only), a higher share of

intangible assets, and higher Tobin's q . All these results accord well with the predictions of the trade-off model of cash holdings (Opler and others, 1999; and Almeida, Campello, and Weisbach, 2002), as it is especially for these types of firms that the cost of accessing external funds or having to cut down investment plans—and thus the benefit of holding additional cash—is larger. However, the table also shows that cash-rich firms tend to be those with the largest excess cash flows, consistent with the view that cash holdings are the side effect of higher earnings and lower capital spending.²² The table also shows that cash-rich firms tend to have smaller net assets from acquisitions (on average, as the zero median reflects the relatively scarce number of firms reporting this type of investment), a relatively higher access to external financing (net cash flow from financing for the 90th percentile is monotonically increasing with cash accumulation), and relatively larger stocks of liquidity (relative to total assets).

Second, a formal regression analysis was conducted to examine the determinants of cash accumulation by G-7 firms. Specifically, changes in cash relative to firm's total assets at firm level were regressed on:

- Firm-level variables, including firm size (defined as logarithm of sales) and firm age (the number of years since the firm was founded, WS 18272, or incorporated, WS 18273).²³
- Industry-level variables, including volatility of sales, the intangible share of long-term assets, Tobin's q , net assets from acquisition as a share of total sources of cash, and industry dummies.
- Country-level variables, including the yield spread (difference between long-term and short-term interest rates; source, IMF, *International Financial Statistics*, or IFS); general gov-

²²This is what the pecking-order model of financing choice would predict. Based on this model, firms try avoiding issuing equity since information asymmetries make it too expensive, and thus accumulate cash—or pay back debt—when faced with a surplus of internal funds. When they have a deficit of internal resources, firms first decrease their cash balances and only eventually raise debt.

²³If both are available for a company, the larger number is used.

Table 4.4. Weighted Average, Median, and 90th Percentile of Selected Series, by Change in Cash to Total Assets by Quartile, 2001–04¹

Variable	First Quartile	Second Quartile	Third Quartile	Fourth Quartile	<i>t</i> -Test of Means First and Fourth Quartile
Change in cash in percent of total assets ²	–3.3 [–3.1] (–1.2)	–0.1 [0.0] (0.4)	1.9 [1.9] (3.4)	8.0 [8.2] (22.3)	105.1
Saving less capital expenditure in percent of total assets ²	1.9 [1.7] (10.1)	1.9 [2.5] (9.3)	2.8 [3.6] (10.8)	6.3 [8.0] (19.7)	29.9
Log of sales ³	13.0 [13.0] (15.3)	13.4 [13.4] (15.9)	13.3 [13.3] (15.6)	12.4 [12.4] (14.8)	–19.2
Log of total assets ³	13.0 [13.0] (15.3)	13.4 [13.4] (16.1)	13.2 [13.3] (15.7)	12.3 [12.3] (14.8)	–21.9
Volatility of sales ⁴	37.6 [11.7] (41.4)	21.7 [11.0] (40.4)	21.3 [11.0] (36.8)	21.1 [15.1] (52.2)	–0.3
Tobin's <i>q</i> ⁴	2.4 [1.0] (2.5)	1.7 [0.9] (2.0)	2.0 [1.0] (2.3)	3.4 [1.4] (3.9)	41.8
Intangible assets in percent of long-term assets ⁴	24.8 [9.4] (73.1)	26.9 [11.2] (71.9)	26.8 [13.4] (71.8)	28.4 [18.5] (77.5)	7.4
Net assets from acquisition in percent of total sources of cash ⁵	6.4 [0.0] (34.3)	5.9 [0.0] (28.7)	5.7 [0.0] (25.6)	3.6 [0.0] (13.7)	–9.0
Net cash flow from financing in percent of total assets ²	–3.8 [–3.5] (4.1)	–2.9 [–2.6] (6.4)	–1.3 [–1.9] (6.2)	–1.0 [–0.6] (17.9)	14.5
Stock of cash in percent of total assets ²	9.6 [8.6] (32.8)	5.0 [2.5] (16.3)	9.6 [8.2] (25.9)	20.4 [21.8] (53.3)	43.7
<i>Memorandum</i>					
Range of change in cash in percent of total assets	–87 to –0.93	–0.93 to 0.61	0.61 to 3.93	3.93 to 100	
Observations	4,330	4,330	4,330	4,329	

Sources: Worldscope; and IMF staff calculations.

¹Median values in brackets, 90th percentile values in parentheses.

²Firm ratios weighted by total assets of firm.

³Simple average of firm ratios.

⁴Firm ratios weighted by market capitalization.

⁵Firm ratios weighted by total sources of cash.

ernment balance as a ratio to GDP (source: IFS); and country dummies.

Industry-level variables were obtained as market capitalization weighted averages of variables at firm level. Seventy-three nonfinancial industries were considered, based on the two-digit U.S. Standard Industrial Classification (SIC) from Worldscope (WS 07021).

The industry-level variables were constructed based only on U.S. data, on the assumption that the underlying feature of an industry can be measured only in the most competitive environment (see Rajan and Zingales, 1998, for a similar methodology). However, the degree to which an industry is exposed to a competitive environment differs among countries, and so the list of

regressors also includes differences (at an aggregate level) between each country and the United States for all industry characteristics.²⁴ As an example, the volatility of revenues from sales of the textile sector in France is proxied by the volatility of sales of the U.S. textile industry and the difference between the aggregate volatility of sales in France and that in the United States. An important motivation for this regression strategy is also that the United States is the only country for which there is a sufficiently large number of firms in every industry in the early years of the sample. Hence, the U.S. industry variables are less likely to be affected by sample biases.

On the set of macroeconomic variables at the country level, the yield spread was included to capture the opportunity cost of holding cash, considering that cash includes short-term interest-bearing securities. The general government-balance-to-GDP ratio was introduced, as it may affect availability of external financing and also to capture the possible offset between corporate and government saving.

Two estimation methods were adopted. First, a cross-section regression was run based on 2001–04 averages. Second, a time series dimension was added by running a panel regression with three periods (the three-year averages: 1996–98, 1999–2001, and 2002–04) so as to assess whether there have been changes in cash accumulation since the mid-1990s. Time dummies were also introduced in the panel regression. The regressions were estimated using weighted ordinary least squares (OLS), with each firm weighted by its (own country) relative market capitalization at the beginning of the period. This gives large firms more weight in the regression, consistent with the objective of explaining the aggregate trends in cash accumulation. At the same time, the within-country market capitalization weighting gives each country the same influence in the regression.

²⁴The exception is Tobin's q , which is considered only at the industry level. This is because cross-country variations of Tobin's q are sensitive to differences in market conditions (e.g., interest rates) and accounting systems, and are thus unlikely to reflect cross-country differences in growth opportunities for firms.

Table 4.5. Regression Results: Dependent Variable—Change in Cash and Short-Term Investments¹

(In percent of total assets)

	Weighted Cross-Section	Weighted Panel
Size of firm	−1.310 (0.034)**	−2.425 (0.001)***
Age of firm	0.003 (0.533)	0.001 (0.913)
Volatility of sales by SIC2 industry	0.165 (0.040)**	0.147 (0.009)***
Intangible asset share of long-term assets by SIC2 industry	0.171 (0.037)**	−0.117 (0.285)
Tobin's q by SIC2 industry	2.581 (0.012)**	0.015 (0.969)
Net assets from acquisitions in percent of total sources of cash by SIC2 industry	0.013 (0.794)	0.073 (0.211)
Volatility of sales by country	−0.001 (0.945)	−0.019 (0.143)
Intangible asset share of long-term assets by country	0.075 (0.311)	0.062 (0.318)
Net assets from acquisitions in percent of total sources of cash by country	0.268 (0.17)	0.292 (0.12)
Yield spread of interest rates, in percent	−0.466 (0.435)	0.215 (0.814)
General government balance, in percent of GDP	−0.348 (0.589)	−0.432 (0.312)
Observations	6,084	12,436
R -squared	0.568	0.552

Sources: Datastream Worldscope database; and IMF staff calculations.

¹Robust p -values in parentheses; ** significant at 5 percent; *** significant at 1 percent.

The results of the analysis are presented in Table 4.5. In particular:

- In the cross-section, the coefficients on firm size, industry sales volatility, Tobin's q , and the industry share of intangible assets all have the expected signs and are significant. None of the country variables is statistically different than zero.
- In the panel regression, only firm size and industry sales volatility have coefficients statis-

tically different than zero. This implies that, over the sample period, cash accumulation has accelerated in industries with higher sales volatility and that the increases in sales volatility have boosted cash accumulation over time.

- In both the cross-section and panel regressions the industry dummies substantially improve the goodness of fit, and are thus included in the final specification (however, they are not reported in Table 4.5). On the contrary, time and country effects are excluded as they are not statistically significant and fail to improve the goodness of fit, implying that both the cross-country and time variations of cash holdings are largely captured by the regressors.

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