



EUROPEAN CENTRAL BANK

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## **“Corporate Finance and Monetary Policy: An Overview of the Issues”**

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Welcome address

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## 1. Welcome and introduction

Ladies and Gentlemen,

It is with great pleasure that I welcome you to Frankfurt, to the ECB workshop entitled “Corporate Finance and Monetary Policy”. The financing of an economy is of crucial importance, as the British statesman William Edward Gladstone observed in 1858: “Finance is, as it were, the stomach of the country, from which all the other organs take their tone”. I shall not present here an overview of the anatomy of the human body, but it is clear to all of us that knowledge of the financing of the corporate sector and of the household sector is crucial if we are to understand and assess economic processes. It is therefore not surprising that the ECB devotes special attention to analysing developments in financing conditions in the euro area, and has brought together here today and tomorrow an distinguished group of academics, market practitioners and central bankers to discuss the role of corporate finance analysis in monetary policy.

The theory of corporate finance covers, as Jean Tirole’s recent textbook exemplifies, a very broad range of topics and directions, and it’s highly likely that their empirical verifications have given rise to an even larger body of literature.<sup>1</sup> Obviously, I can only discuss a few issues, those which are of particular interest to central bankers. Of course, I’m not implying that we at the ECB are *only* interested in those issues and that others are not relevant to monetary policy-making and implementation. The variety of papers which have been selected for this workshop illustrate our firm belief that we need to pay close attention to the many different aspects of corporate finance, both theoretical and empirical, as they all have the potential to fundamentally contribute to our understanding of financial processes and their interaction with monetary policy and the economic system.

## 2. Development of corporate finance theory

Corporate finance may be defined as the study of the way firms are financed and as such is one of the central pillars of finance theory in general.<sup>2</sup> The three main areas of corporate finance theory are the financing or the capital structure of the firm, its optimal governance structure, which constitutes the field of corporate governance, and the valuation of the firm. In my overview, I shall largely focus on the financing of non-financial corporations, partly because of limitations of time, and partly because of its particular relevance to monetary policy analysis.

As you all know, the foundation of the modern theory of corporate finance was laid by Modigliani and Miller when they introduced in 1958 their so-called “capital structure irrelevance” hypothesis.<sup>3</sup> An important development in corporate finance theory was the recognition in the 1970s that, in contrast to the Modigliani-Miller assumptions, financial markets and corporate financing decisions are characterised by agency costs and asymmetric information.<sup>4</sup> Agency costs arise because of conflicts of interest between various groups of stakeholders, such as management, debt-holders and shareholders, and affect the capital structure of the firm. In corporate finance theories based on agency costs, the capital structure of a firm is seen as a kind of contract that can reconcile different incentives, or solve so-called “principal-agent problems” that exist between the firm’s shareholders or principals and managers or agents.

Asymmetric information refers to differences in knowledge between two parties – for example borrowers and lenders – that result in one having an information advantage over the other, causing significant problems such as adverse selection and moral hazard. In general, these information asymmetries may influence the financing decisions of non-financial corporations and thus their capital structure. The concepts of agency costs and asymmetric information have increasingly dominated corporate finance theory, and have become fundamental aspects of the daily financial decision-making of non-financial corporations as well.

Subsequently, based on these new insights, a large body of different theories on corporate financing decisions has been developed.<sup>5</sup> These include, for example, “optimal” capital structure and “trade-off” theories, which focus on specific debt-equity ratio targets,<sup>6</sup> signalling models of information asymmetries between insiders and outsiders,<sup>7</sup> the “pecking-order” theory, which contends that there is an implicit ranking of the sources of corporate finance – with a first preference for internal financing, the cheapest form of finance, followed by debt financing and lastly by equity financing<sup>8</sup> – and “free cash flow” theory<sup>9</sup>. I shall not discuss these theories further but their empirical investigations, which are still ongoing in different ways and formats, have yielded a considerable amount of evidence on how financing practices in the corporate sector worldwide affect the day-to-day functioning of the economy.

These developments in the theory and empirics of corporate finance have been tremendously important for central banks, as they offered us valuable insights into developments in the financing of the corporate sector and their significance for monetary policy analysis. I shall now turn in more detail to this latter aspect.

### **3. Corporate finance theory and monetary policy**

One of the most interesting developments in economics in the second half of the 20th century, from my perspective as a central banker, has been the increasing interaction between finance theory on the one hand and monetary and business cycle theory on the other.<sup>10</sup> This process involved mostly, but not exclusively, the introduction of concepts from finance in general and corporate finance in particular into economics, or more specifically into macroeconomics, and was accompanied by the development of financial economics.<sup>11</sup> The importance of an integrated approach involving both areas was formulated by Lawrence Summers in 1984 as follows: “The fields of economics and finance are allied. Neither the finance approach to financial markets nor the approach taken by general economists has a unique claim on virtue. Rather, both are complementary. Both have the potential to increase our understanding of how the economy operates.”<sup>12</sup>

From the late 1950s to the early 1970s, the interaction between finance and macroeconomics was initiated mainly by incorporating financial processes in the transmission mechanism of monetary and fiscal policies and consequently linking them to real developments. A major element in the increasing interdependence of both disciplines was the introduction of portfolio theory by Harry Markowitz in 1952 and its subsequent introduction into monetary theory – in particular into money demand theory via portfolio selection theory – by James Tobin in 1958.<sup>13</sup> Subsequently, Tobin contributed fundamentally to the analysis of the impact of asset valuation, which, as I mentioned before, is one of the three main areas of corporate finance, on real investment and economic growth via the introduction of Tobin’s Q.<sup>14</sup> This concept, as you know, established a direct

relationship between the stock market on the one hand and (real) investment behaviour on the other.<sup>15</sup> Through Tobin's work, some of which was done jointly with William Brainard, corporate financing became, via the required rate of return on funds provided or, in Tobin's words, the "supply price of capital", an integral element of the monetary policy transmission process, linking financing with real investment.<sup>16</sup>

During the 1980s and 1990s, the advancement of corporate finance theory via the introduction of the concepts of agency costs and asymmetric information found its way into general economic studies. The link between the literature on corporate finance and the optimal capital structure of the firm on the one hand and investigations of macroeconomic developments on the other was established via models of financial intermediation, which describe the effects of information asymmetries and agency problems in financial markets on the allocation of funds and corporate financing decisions.<sup>17</sup> These models assert that such market imperfections could lead to inefficiencies in financial markets that may have real effects on the economy, consequently affecting the choices of sources of corporate financing. Over the years, an extensive body of literature has been developed, covering both credit and equity markets in situations of imperfect information leading to incentive problems in financial relationships. With respect to credit markets, the Jaffee-Russell and Stiglitz-Weiss models of credit rationing asserted that the existence of imperfect information may lead to situations of credit rationing, which are characterised by an excess demand for loans where prospective borrowers do not obtain bank financing even if they are willing to pay higher interest rates.<sup>18</sup> Turning to equity markets, Greenwald, Stiglitz and Weiss showed, based on the seminal contribution to corporate finance theory by Myers and Majluf, that informational problems may also give rise to equity rationing, in the sense that firms may act as if they cannot raise additional equity capital.<sup>19</sup> Subsequent research tried to integrate both credit and equity rationing and their economic impact in a single framework.<sup>20</sup> All in all, this strand of literature showed that it may not only be the cost of capital that determines the level of investment but the availability of capital as well.

Ben Bernanke, in joint work with Mark Gertler and others, showed that credit market imperfections in the form of agency costs may make external finance more costly than internal financing.<sup>21</sup> That is, the external finance premium could make it more difficult for certain borrowers to obtain funds in the event of a fall in the value of the assets pledged as collateral for debt. This amplification of macroeconomic shocks through changes in credit market conditions that affect balance sheet positions and cash-flow developments is known as the financial accelerator effect. In other words, financing constraints caused by imperfect information on credit markets may exacerbate economic disturbances. These market imperfections may particularly affect companies that face significant agency costs, such as small firms or firms with weak balance sheets. The amplifying nature of economic shocks caused by informational imperfections in financial markets was further developed into macroeconomic theory by Greenwald and Stiglitz in 1993.<sup>22</sup>

The importance of imperfect capital markets in explaining economic developments, such as developed in the aforementioned theories, found their way into the monetary policy transmission mechanism via various channels. The theory of the balance sheet channel asserts that a change in monetary policy may have an impact on borrowers' balance sheet positions or their net worth.<sup>23</sup> This, in turn, modifies the external finance

premium and consequently the overall terms of credit for borrowers. From a different perspective but also based on capital market imperfections, the bank lending channel theory emphasises that monetary policy actions may have asymmetric effects due to different financing constraints faced by different kinds of firm. That is, due to the presence of asymmetric information in borrower-lender relationships, monetary policy is expected to have a relatively strong impact on non-financial corporations which are unable to resort to internal finance or to other sources of external financing than bank loans, such as small and medium-sized firms – which play an important role in the euro area – or highly leveraged firms. Further discussion of this literature is beyond the scope of this presentation, but I would like to mention that important empirical evidence for the euro area has been gathered in the context of the work of the Eurosystem's Monetary Policy Transmission Network.<sup>24</sup>

Overall, looking back over the past 20 years or so, a large body of empirical studies has grown up that investigates in different ways and from different angles the importance of financing constraints caused by informational imperfections which affect the access of individual firms to capital markets on macroeconomic developments in general and the transmission of monetary policy in particular.<sup>25</sup> In this respect, I would just like to mention some examples of particular relevance to today's academic discussion. Fazzari, Hubbard and Petersen have suggested that the investment made by firms that have exhausted nearly all of their internal financing may be more sensitive to their cash flow position than firms that pay high dividends.<sup>26</sup> This finding has been questioned more recently, and a lively debate has emerged on the appropriate methodology to assess financing constraints.<sup>27</sup> For the euro area, research has suggested that, because of financing constraints, corporate investment may be relatively sensitive to the availability of internal financing, that is, to movements in cash flow.<sup>28</sup>

#### **4. Corporate finance analysis at the ECB**

The theoretical and empirical progress that has been made on the relevance and significance of corporate finance developments to macroeconomic processes has provided ample evidence – in my view – that central banks can benefit significantly from a regular analysis of developments in financing conditions in order to evaluate monetary policy outcomes and determine the appropriate monetary policy stance.<sup>29</sup> It is clear that changes in financing conditions may have important repercussions for the working of the monetary policy transmission process. For example, if non-financial corporations were to make greater use of securities to finance their operations, this could lead to a larger exposure of firms to swings in financial markets, to more competitive pricing of loans by banks or to a greater importance of wealth effects. The process of monetary transmission could be affected through all these channels. From another angle, if specific types of firm were constrained in gaining access to particular sources of financing, this could affect the ultimate results of monetary policy actions as well.

Given the importance of financial developments for monetary policy-making, the Governing Council of the ECB is provided with regular, up-to-date assessments of financing conditions in the euro area. These include a review of the cost of the various sources of finance and the factors that may determine it. In addition, the Governing Council is regularly informed about the availability of funds to enterprises and the reasons for the

supply of and demand for these funds. In this respect, crucial information is obtained from the ECB's bank lending survey, which is conducted via the national central banks in the euro area countries. I shall not pay attention to the specific details of this process, since these will be explained in one of the presentations today.

## **5. Concluding remarks**

Let me now conclude. In this brief contribution, I have tried to provide an overview of the development of corporate finance theory and its impact on macroeconomic theory, a process which has generated a large number of empirical studies as well. I hope I have made it clear that this process has been very interesting and rewarding for central bankers in their understanding of the economy and operation of the transmission process of monetary policy. The ECB will continue to build up its briefing and analytical capabilities in this respect, within the Eurosystem and in close interaction with other central banks and the academic community.

As the philosopher Karl Popper said, it is the aim of science to find *satisfactory* explanations of whatever strikes us as being in need of explanation.<sup>30</sup> I have no doubt that the outcome of this workshop will be much more than satisfactory and that it will enhance our understanding of vital processes in the functioning of the economic system, in particular the relevance and significance of developments in corporate finance to monetary policy analysis and assessment. I wish you a very interesting and stimulating discussion, which will be centred around four main topics: i) the role of corporate finance analysis in central banking, ii) corporate finance, financing constraints and investment, iii) theoretical aspects of corporate finance and iv) certain other aspects of corporate finance. I look forward to hearing about the results.

- <sup>1</sup> J. Tirole, *The Theory of Corporate Finance*, Princeton and Oxford: Princeton University Press, 2006.
- <sup>2</sup> L. Zingales, "In Search of New Foundations", *Journal of Finance*, Vol.55, No.4, August 2000, pp.1623-1653; see also P. Bolton and D.S. Scharfstein, "Corporate Finance, the Theory of the Firm, and Organisations", *Journal of Economic Perspectives*, Vol.12, No.4, Fall 1998, pp.95-114 .
- <sup>3</sup> F. Modigliani, and M. H. Miller, "The Cost of Capital, Corporation Finance and the Theory of Investments", *American Economic Review*, Vol.48, No.3, June 1958, pp.261-297.
- <sup>4</sup> S.A. Ross, "The Economic Theory of Agency: The Principal's Problem", *American Economic Review*, Vol.63, No.2, Papers and Proceedings, May 1973, pp.134-139; M. Jensen and W. Meckling, "Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure", *Journal of Financial Economics*, Vol.3, No.4, October 1976, pp.305-360. See also European Central Bank, "Characteristics of corporate finance in the euro area", *Monthly Bulletin*, February 2001, pp.37-50.
- <sup>5</sup> M. Harris and A. Raviv, "The Theory of Capital Structure", *Journal of Finance*, Vol.46, No.1, March 1991, pp.297-355; J. Amaro de Matos, *Theoretical Foundations of Corporate Finance*, Princeton: Princeton University Press, 2001; S.C. Myers, "Capital Structure", *Journal of Economic Perspectives*, Vol.15, No.2, Spring 2001, pp.81-102; J. Tirole, 2006.
- <sup>6</sup> S.C. Myers, "Financing of Corporations", in G. Constantinides, M. Harris and R. Stulz (eds.), *Handbook of the Economics of Finance – Volume 1A Corporate Finance*, Amsterdam: North-Holland, pp.215-253.
- <sup>7</sup> H. Leland and D. Pyle, "Informational Asymmetries, Financial Structure and Financial Intermediation", *Journal of Finance*, Vol.32, No.2, Papers and Proceedings, May 1977, pp.371-387; S.A. Ross, "The Determination of Financial Structure: The Incentive-signalling Approach", *Bell Journal of Economics*, Vol.8, No.1, 1977, pp.23-40.
- <sup>8</sup> S.C. Myers, "The Capital Structure Puzzle", *Journal of Finance*, Vol.39, No.3, Papers and Proceedings, July 1984, pp.575-592; S.C. Myers and N. S. Majluf, "Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have", *Journal of Financial Economics*, Vol.13, No.2, June 1984, pp.187-221.
- <sup>9</sup> M.C. Jensen, "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers", *American Economic Review*, Vol.76, No.2, Papers and Proceedings, May 1986, pp.323-329; See also Myers, 2001.
- <sup>10</sup> This contribution will not elaborate on the use of financial market information by central banks. For an ECB perspective see: European Central Bank, "Extracting information from financial asset prices", *Monthly Bulletin*, November 2004, pp.65-79.
- <sup>11</sup> See for example J.J. Sijben, *Money and Finance: An Increasing Interdependence*, Tilburg: Tilburg University Press, 1986. For attempts to introduce monetary elements into finance theory and consequently establish a unified theory of money and finance see for example: R.E. Lucas, "Money in a Theory of Finance", *Carnegie-Rochester Conference Series on Public Policy*, 21, 1984, pp.9-46.
- <sup>12</sup> L.H. Summers, "On Economics and Finance", *Journal of Finance*, Vol.40, No.3, Papers and Proceedings, July 1985, pp.633-635.
- <sup>13</sup> H. Markowitz, "Portfolio Selection", *Journal of Finance*, Vol.7, No.1, March 1952, pp.77-91; J. Tobin, "Liquidity Preference as Behaviour Towards Risk", *The Review of Economic Studies*, Vol.25, No.2, February 1958, pp.65-86.
- <sup>14</sup> J. Tobin, "A General Equilibrium Approach to Monetary Theory", *Journal of Money, Credit and Banking*, Vol.1, No.1, February 1969, pp.15-29. See also: J. Tobin, "Monetary Policies and the Economy: The Transmission Mechanism", *The Southern Economic Journal*, January 1978, pp.421-431, and Tobin's Nobel Prize Lecture: J. Tobin, "Money and Finance in the Macroeconomic Process", *Journal of Money, Credit and Banking*, Vol.14, No.2, May 1982, pp.171-204.
- <sup>15</sup> Empirical verifications of the q-theory of investment, however, have yielded ambiguous results. See for example: G.M. von Furstenberg, "Corporate Investment: Does Market Valuation Matter in the Aggregate?", *Brookings Papers on Economic Activity*, No.2, 1977, pp.347-408; S. Fisher and R.C. Merton, "Macroeconomics and Finance: The Role of the Stock Market", *Carnegie-Rochester Conference Series on Public Policy*, 21, 1984, pp.57-108.
- <sup>16</sup> J. Tobin, "Money, Capital, and Other Stores of Value", *American Economic Review*, Vol.51, No.2, Papers and Proceedings, May 1961, pp.26-37; W.C. Brainard and J. Tobin, "Pitfalls in Financial Model Building", *American Economic Review*, Vol.58, No.2, Papers and Proceedings, May 1968, pp.99-122.
- <sup>17</sup> M. Gertler and R.G. Hubbard, "Financial Factors in Business Fluctuations", in Federal Reserve Bank of Kansas City, *Financial Market Volatility*, Symposium Proceedings, Jackson Hole, 17-19 August 1988, pp.33-71; M. Gertler, "Financial Structure and Aggregate Economic Activity: An Overview", *Journal of Money, Credit and Banking*, Vol.20, No.3, Part 2, August, 1988, pp.559-588; R.G. Hubbard, "Capital-Market Imperfections and Investment", *Journal of Economic Literature*, Vol.36, No.1, March, 1998, pp.193-225; J.E. Stiglitz, "Information and the Change in the Paradigm in Economics", *Nobel Prize Lecture*, 8 December 2001; J.C. Stein, "Agency, Information and Corporate Investment", in G. Constantinides, M. Harris and R. Stulz (eds.), *Handbook of the Economics of Finance – Volume 1A Corporate Finance*, Amsterdam: North-Holland, pp.111-165.
- <sup>18</sup> D. Jaffee and T. Russell, "Imperfect Information, Uncertainty, and Credit Rationing", *Quarterly Journal of Economics*, Vol.90, No.4, November 1976, pp.651-666; J.E. Stiglitz and A. Weiss, "Credit Rationing in Markets with Imperfect Information", *American Economic Review*, Vol.71, No.3, June 1981, pp.393-410.
- <sup>19</sup> B. Greenwald, J.E. Stiglitz and A. Weiss, "Informational Imperfections in the Capital Market and Macroeconomic Fluctuations", *American Economic Review*, Vol.74, No.2, Papers and Proceedings, May 1984, pp.194-199; Myers and

Majluf, 1984, see endnote 8; See also: J.E. Stiglitz and B. Greenwald, *Towards a New Paradigm in Monetary Economics*, Cambridge: Cambridge University Press, 2003.

<sup>20</sup> D. DeMeza and D. Webb, “Too Much Investment: A Problem of Asymmetric Information”, *Quarterly Journal of Economics*, Vol.102, No.2, May 1987, pp.281-292; T. Hellmann and J. Stiglitz, “Credit and Equity Rationing in Markets with Adverse Selection”, *European Economic Review*, Vol.44, No.2, February 2000, pp.281-304.

<sup>21</sup> B.S. Bernanke and M. Gertler, “Agency Costs, Net Worth, and Business Fluctuations”, *American Economic Review*, Vol.79, No.1, March 1989, pp.14-31; B.S. Bernanke, M. Gertler and S. Gilchrist, “The Financial Accelerator and the Flight to Quality”, *The Review of Economics and Statistics*, Vol.78, No.1, February 1996, pp.1-15.

<sup>22</sup> B.C. Greenwald and J.E. Stiglitz, “Financial Market Imperfections and Business Cycles”, *Quarterly Journal of Economics*, Vol.108, No.1, February 1993, pp.77-114.

<sup>23</sup> See also J. Berg, A. van Rixtel, A. Ferrando, G. de Bondt and S. Scopel, “The Bank Lending Survey for the Euro Area”, European Central Bank, *Occasional Paper Series*, No.23, February 2005.

<sup>24</sup> I. Angeloni, A. Kashyap and B. Mojon (eds.), *Monetary Policy Transmission in the Euro Area*, Cambridge: Cambridge University Press, 2003.

<sup>25</sup> See for example: S.M. Fazzari and M.J. Athey, “Asymmetric Information, Financing Constraints, and Investment”, *The Review of Economics and Statistics*, Vol.69, No.3, August 1987, pp.481-487; T.M. Whited, “Debt, Liquidity Constraints, and Corporate Investment: Evidence from Panel Data”, *Journal of Finance*, Vol.47, No.4, September 1992, pp.1425-1460; M. Gertler and S. Gilchrist, “Monetary Policy, Business Cycles, and the Behaviour of Small Manufacturing Firms”, *Quarterly Journal of Economics*, Vol.109, No.2, May 1994, pp.309-340; R. Carpenter and B.C. Petersen, “Is the Growth of Small Firms Constrained by Internal Finance?”, *The Review of Economics and Statistics*, Vol.84, No.2, May 2002, pp.298-309.

<sup>26</sup> S.M. Fazzari, R.G. Hubbard and B.C. Petersen, “Financing Constraints and Corporate Investment”, *Brookings Papers on Economic Activity*, No.1, 1988, pp.141-206.

<sup>27</sup> S.N. Kaplan and L. Zingales, “Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?”, *Quarterly Journal of Economics*, Vol.112, No.1, February 1997, pp.169-215; S.M. Fazzari, R.G. Hubbard and B.C. Petersen, “Investment-Cash Flow Sensitivities are Useful: A Comment on Kaplan and Zingales”, *Quarterly Journal of Economics*, Vol.115, No.2, May 2000, pp.695-705; S.N. Kaplan and L. Zingales, “Investment-Cash Flow Sensitivities are not Valid Measures of Financing Constraints”, *Quarterly Journal of Economics*, Vol.115, No.2, May 2000, pp.707-712; T. Ericson and T. Whited, “Measurement Error and the Relationship Between Investment and Q”, *Journal of Political Economy*, Vol.108, No.5, October 2000, pp.1027-1057; A. Altı, “How Sensitive is Investment to Cash Flow When Financing is Frictionless?”, *Journal of Finance*, Vol.58, No.2, April 2003, pp.707-722; H. Almeida, M. Campello and M.S. Weisbach, “The Cash Flow Sensitivity of Cash”, *Journal of Finance*, Vol.59, No.4, August 2004, pp.1777-1804.

<sup>28</sup> I. Angeloni, A.K. Kashyap, B. Mojon and D. Terlizzese, “Monetary Policy Transmission in the Euro Area: Where Do We Stand?”, in I. Angeloni, A. Kashyap and B. Mojon (eds.) (2003), pp.383-412.

<sup>29</sup> L. Bê Duc, G. de Bondt, A. Calza, D. Marqués Ibáñez, A. van Rixtel and S. Scopel, “Financing Conditions in the Euro Area”, European Central Bank, *Occasional Paper Series*, No.37, October 2005.

<sup>30</sup> K.R. Popper, *Objective Knowledge: An Evolutionary Approach*, Oxford: Oxford University Press, 1972, p.191.