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Financial regulation and market efficiency: The behavioural perspective

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Introduction

Finance has assumed a privileged role in economics' studies, since it is essential to understand macroeconomics. Problem is we do not know how finance work: economists are still figuring out what rules move the world of finance, and there is plenty of space for new theories and ideas. One of the few good things of living during a global recession is to witness the resulting theoretical and ideological revolution. Many of the assumptions we made on the functioning of financial markets are being questioned, and theories challenged. The problem with economics, compared with other sciences, is that, even though we have an infinite amount of data, there is no way to make experiments: the only way to try our models is to see them applied in real policies and see what happens, in a sort of trial and error process. The problem is that the effects of economical policies are quantifiable only in the long run and it takes years to draw final conclusions on the matter, if conclusions are possible. The second problem is that a real economy is an open environment where an infinite amount of unexpected and unpredictable variables can influence the results. Also, every country has a different environment and the passing of times changes the same environment by bringing new technologies, social reforms and other factors. These elements make economy a work in progress discipline where every deviation from a model drives scientists back to the start, to figure out if the model is wrong or they missed something. The global Financial crisis was one of those big deviations, but this time everyone already knew what was going wrong: deregulation. The aim of the thesis is to explain why it went wrong. How we organize financial markets and banks should interest everyone, since the future of the economy and the future of our lives depends on it, and every field of our society is touched by it. Currently, Behavioural Finance is occupying a growing relevant space in the field, challenging the undisputed domain of the Efficient Market Theory of the last decade, Keynes has come out stronger by the recent crisis.

The reason why I chose this topic is the large amount of connections it shares with subjects other than economy: history, law, politics, philosophy, psychology et cetera. Deregulation and policies in general always involve the influence of other fields of study, which in this case happen to be more humanistic than scientific. As we will see, a good model is useless if it does not reflect reality and if it does not offer any practical solution. The eclectic nature of deregulation makes the economist look more like a social scientist than a pure mathematician, and I think that it was time someone did it. The idea of finance and economic being purely mathematical studies is largely discussed in the thesis, it constitutes one of the major themes. In particular, we discuss about the rationality of individuals and rationality of financial markets. The implication of irrational agents is that we should worry about the outcomes of free markets, since we do not know where it twill bring us.

The thesis is composed by three chapters, each with his own subchapter. Chapter 1 is a brief history on financial deregulation in the US from the 1929 to 2008, and a short overview of Efficient Market Hypothesis and its origin in American culture. Chapter 2 is focused on the Global Financial Crisis and the responsibilities of institutions in the creation of a bubble. Chapter 3 introduces behavioural Finance into the argument, telling its story, the foundations behind the study of human behaviour and its application in economics, the incompatibility between Behavioural Finance e and the Efficient Market Hypothesis. The last chapter is about the importance of behavioural Finance into financial regulation, and its implementation .

Chapter 1

History of Financial Deregulation in the US:

from the Great Depression to the Great Recession

Later in the chapter we will discuss about financial deregulation in the US, its history, how it started and the consequences. The aim is to set the premise for a deeper insight into the connections between the deregulation approach to finance and the theory of efficient market hypothesis.

1.1 The Great Depression and the New Deal

The first useful example of financial deregulation dates back to the beginning of the twentieth century when, in 1916, the Uniform Small Loan Law passed[1]. This act allowed regulated lenders to increase the interest rate at 24% to 42%, in exchange for transparency and disclosure requirements, in order to compete with small rates loan sharks. Loan sharks success was due to the absence of legal competitors, since no legal small loan lender could operate at the required interest rates. Before the Uniform Small Law, the interest rate ceilings were set at no more than 8% per annum, which was insufficient in the small loans market. The reason is that small loans have an higher insolvency risk, since they are usually meant for consuming purposes (and not for investment purposes, like commercial banks). Small loans also require higher supervision, investigation and bookkeeping costs. Lastly, small loans lenders use capital, while commercial banks use credit, which allows to lend amounts bigger than the their capital[2].

Later on, in the aftermath of the 1929 Great Depression, the need for a more stringent regulation takes over. In 1933, the Glass-Steagall act[3], signed by President Franklin Delano Roosevelt, a fierce ideological opponent of American individualism and its economical branching, financial deregulation, established a new set of rules for the American Banking system: Regulation Q, which imposed a limit on the interest rates which banks could impose on deposits, aiming to prevent rate wars; the FDIC, Federal Deposit Insurance Corporation, which mitigated the risk of bank runs by

[1] «The Uniform Small Loan Law on JSTOR», s.d., https://www.jstor.org/stable/1330334?seq=1.
[2] «The Uniform Small Loan Law», *Harvard Law Review*, vol. 42, fasc. 5, marzo 1929, p. 689.
[3] «Federal Reserve Bank of New York Circulars, 1248. Banking Act of 1933 | FRASER | St. Louis Fed», s.d., https://fraser.stlouisfed.org/title/federal-reserve-bank-new-york-circulars-466/1248-banking-act-1933-15952.

guaranteeing consumer deposits and the separation between investment and commercial banks. Many other legislation acts followed on that same path that the Glass Steagall traced.

On the security market:

- The Securities Act of 1933[4] (also known as Truth in Securities act) was the first federal law regarding the sale of securities, and protected investors by providing them with a better information disclosure;

- The Securities Exchange Act of 1934[5] (SEA) authorized the formation of the Securities Exchange Commission (SEC) and regulated the secondary market for securities by imposing a set of requirements, enforced by the SEC[6], reducing the risk of market manipulation and frauds;

- The Commodity Exchange Act of 1936[7], which set rules for trading in the futures market.

For Thrift Institutions:

-In 1932 the Federal Home Loan Bank Board was created by the Federal Home Loan Bank act[8], in order to oversee thrift associations;

- In 1934 Bureau of Federal Credit Unions was created under the Federal Credit Union Act[9], for the same surveillance purpose of regulating the credit union institutions.

Each one of these federal regulations is part of the New Deal, the political and economical plan designed by president Franklin D. Roosevelt, and the federal institutions created in those years still exist today. Before, Corporate and Banking law have always had been addressed by state law, causing a State Competition which is still relevant in US corporate law and saw the state of Delaware imposing itself in the so called "Delaware's Dominance".

During the period of time between the post WWII and the sixties, the American economy grew steadily, coherently with most of other western nations. This period was called the "Glorious Thirty", "*le Trente glorieuse"* in France, o*"Il Miracolo Economico"* in Italy, In this context, the implant of rules set by Roosevelt remained undisputed. The situation changes with the end of the golden age of

[4] «(No Title)», s.d., https://sec.report/Form/Securities-Act-of-1933.pdf.
[5] Us Congress, *SECURITIES EXCHANGE ACT OF 1934 TITLE I-REGULATION OF SECURITIES EXCHANGES. Sec. 1. Short Title. Sec. 2. Necessity for Regulation As Provided in This Title. Sec. 3. Definitions and Application of Title. Sec. 3A. Swap Agreements*, 2012.
[6] United States Congress, *Commodity Exchange Act*, giugno 15, 1936, http://fraser.stlouisfed.org/.
[7] *Ivi*.
[8] «Federal Home Loan Bank Act | Federal Housing Finance Agency», s.d., https://www.fhfa.gov/Government/Pages/Federal-Home-Loan-Bank-Act.aspx.
[9] «TOPN: Federal Credit Union Act | US Law | LII / Legal Information Institute», s.d., https://www.law.cornell.edu/topn/federal_credit_union_act.

the Glorious Thirty, when inflation drastically increases, fixed rates come to an end and banks need to adjust their interest rates. Starting from the seventies, the financial legislation set by Roosevelt will be dismantled piece by piece.

1.2 Marquette National Bank v. First of Omaha Service Corp

As we just said, US Corporate and Banking Law is strongly shaped by the State Competition among jurisdictions: in order to attract banks, corporations, and businesses in general, states compete between each other by creating a business friendly regulation. Delaware is now the leading state in the matter of corporate law. State law in the United States is shaped by this competitive framework which, by default, is very deregulation driven. Restrictive regulations, standards and duty requirements always come by the Federal law. The issue on whether a decision is state or federal matter emerges very often.

During the 70s, inflation caused an increase of interest rates, which made inadequate the interest rate ceilings imposed by the usury laws. In this context lies the case of Marquette National Bank v. First of Omaha Service Corp:

> *"The First National Bank of Omaha (Omaha Bank) is a national banking association chartered in Nebraska; it is enrolled in the Bank Americard plan, and solicits for that plan in Minnesota. Omaha Bank charges its Minnesota cardholders interest on their unpaid balances at a rate permitted by Nebraska law, but in excess of that permitted by Minnesota law. The Marquette National Bank of Minneapolis (Marquette), a Minnesota-chartered national banking association enrolled in the BankAmericard plan, brought suit in Minnesota against Omaha Bank and its subsidiary, respondent First of Omaha Service Corp., inter alia, to enjoin the operation of Omaha Bank's BankAmericard program in Minnesota until such time as it complied with the Minnesota usury law. Rejecting respondent's contention that Minnesota's usury law was preempted by the National Bank Act provision codified as 12 U.S.C. § 85, which authorizes a national banking association "to charge on any loan" interest at the rate allowed by the laws of the State "where the bank is located," the state trial court granted Marquette's motion for partial summary judgment. The Minnesota Supreme Court reversed.[10]"*

[10] «Marquette Nat. Bank v. First of Omaha Svc. Corp. :: 439 U.S. 299 (1978) :: Justia US Supreme Court Center», s.d., https://supreme.justia.com/cases/federal/us/439/299/.

Marquette Nat. Bank v. First of Omaha Svc. Corp., 439 U.S. 299 (1978)

Omaha Bank, a National Bank chartered in Nebraska, was charging its Minnesota credit card customers interest rates permitted in Nebraska but higher than the ones permitted by Minnesota Law. The Court stated that a National Bank was allowed to export its chartering State law's interest rate ceilings, rather than adopting the borrower's home state's ones. This sentence prompted states to completely eliminate interest rate ceilings but not usury law, which remained on book but disappeared de facto.

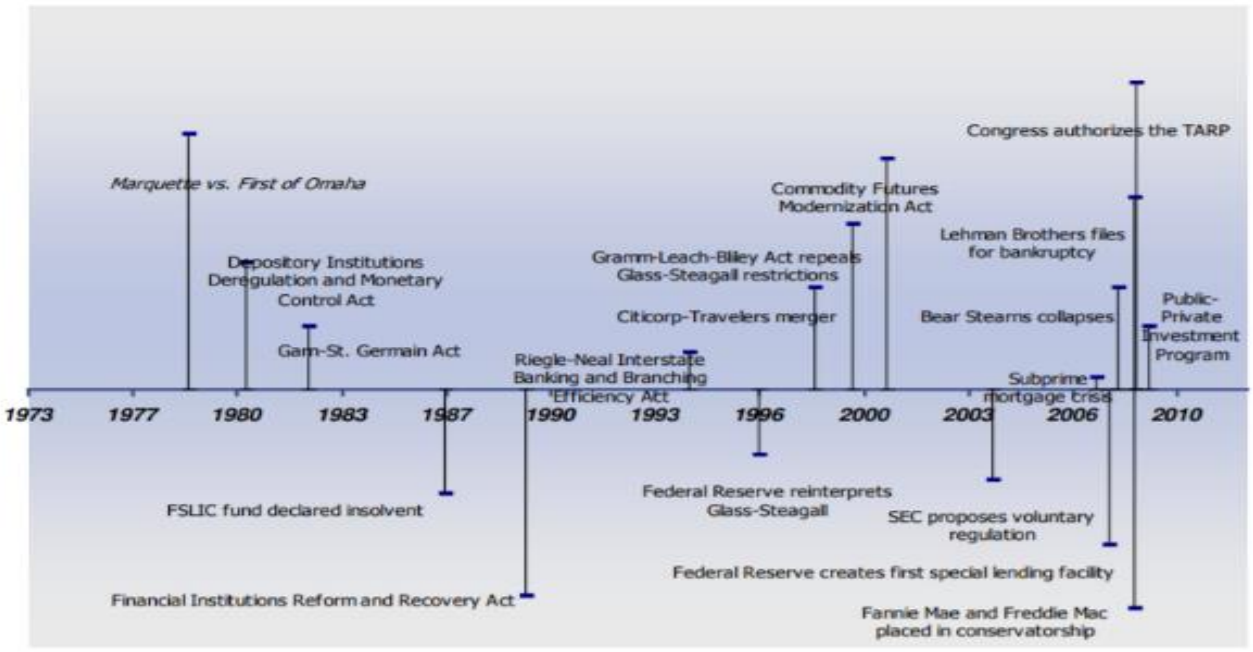


Table 1 from Matthew Sherman, A Short History of Financial Deregulation in the United States, 2009, www.cepr.net. [11]

1.3 The 80s' wave of deregulation

As long as the economy prospered, restrictive regulations were no more needed. As Minsky stated, the cyclical course of modern capitalistic economy and human behaviour requires legislators to regulate financial markets and dangerous speculations to prevent financial crises. But, after a while, the urge for regulations ceases to be so compelling and businesses start to press for more *laissez faire*.

[11] Matthew Sherman, *A Short History of Financial Deregulation in the United States*, 2009, www.cepr.net.

The prospect of larger returns induce businesses to undertake riskier transactions, while the government, subject to a great pressure, allows less stringent regulations: this relaxation is the prodrome of a new crisis. In his analysis, Minsky resulted to be prophetically right[12]. He did not live enough to witness the new crisis, but his writings gained much popularity after the Great Recession of 2008. However, it is still debated whether and to what extent the wave of deregulation of 1980s is to be considered to have caused the crisis.

The Depository Institutions Deregulation and Monetary Control Act (DIDMCA) was enacted in 1980 by president Jimmy Carter and the Fed chairman Paul Volcker, and was, as stated in the DIDMCA itself,:

> "*An Act to Facilitate the Implementation of Monetary Policy, to Provide for the Gradual Elimination of All Limitations on the Rates of Interest Which Are Payable on Deposits and Accounts, and to Authorize Interest-bearing Transaction Accounts, and for Other Purposes*"[13].

As we already discussed, inflation rates in those years went double digit thanks to the inflation, making it impossible to adhere with the inadequate interest rates' limits. Furthermore, another important factor caused the government to definitely remove interest rate ceilings on deposits: in those years, "banks and other traditional types of depository institutions were at a severe disadvantage in attracting deposits compared with less-regulated competitors, such as money market mutual funds" (Depository Institutions Deregulation and Monetary Control Act of 1980, Kenneth J. Robinson, Federal Reserve Bank of Dallas, November 22, 2013)[14]. The introduction of commercial papers as a mean to bypass commercial banks, which traditionally served as intermediaries, Mutual funds operated without reserve requirements and interest rate ceilings, which made them extremely attractive among small investors, whom withdrawn their accounts out of depositary institutions. So, interest rate ceilings were definitely removed. The second goal of the DIDMCA was to strengthen monetary control over money supply by imposing reserve requirements on every depositary institution, not only on member ones. This also allowed Federal Reserve to collect more data depositary institutions assets and liabilities[15].

The Garn-St Germain Act of 1982 was introduced to *"revitalize the housing industry by strengthening the financial stability of home mortgage lending institutions and ensuring the availability of home*

[12] Steven Pressman, *Hyman Minsky and behavioral finance*, *Journal of Behavioral Economics for Policy*, vol. ii, 2018.
[13] United States. Congress, *Depository Institutions Deregulation and Monetary Control Act of 1980*, marzo 31, 1980.
[14] «Depository Institutions Deregulation and Monetary Control Act of 1980 | Federal Reserve History», s.d., https://www.federalreservehistory.org/essays/monetary-control-act-of-1980.
[15] *Ivi*.

mortgage loans" [16]. It pursued the same goal of the precedent DIDMCA, to ease the restraints on depositary institutions, and it did so by granting more freedom of action to thrifts and granting a financial sustainment to firms in distress[17]. In particular, Title VIII allowed lenders to make new alternative mortgages, some of which will lately result into problems during the 2008 financial crisis (subprime titles and risky loans catastrophe). Both these acts had the aim to eliminate barriers to competition and to allow market mechanism to establish deposits and loan rates[18].

The deregulation wave proceeded with more act and legislations which aimed at disrupting the old ones dating to the post Great Depression era. The Alternative Mortgage Transactions Parity Act of 1982[19] was another relevant legislative act which permitted the introduction of new complex mortgages, a feature that will result to be crucial in the years to come. In August 1987, Alan Greenspan was appointed as Chairman of the Federal Reserve. He was a student of Ayn Rand's "objectivism", the famous capitalistic doctrine, whose doctrine reflected on his policy as Fed's Chairman: Greenspan was a strong promoter of deregulation, and in fact the most controversial decision undertaken under his mandate (which was the second longest mandate in the history of the Fed) was the repeal of Glass-Steagall Act. The Glass Steagall Act had already been reinterpreted in 1986 under Volcker presidency, when the Federal Bank ruled that a thrift bank could derive a profit of 5% from investment banking. This change of rules was justified by the vague indications provided by the Glass Steagall Act on the meaning of the expression "engaged principally", which was previously interpreted as a total distinction between the two sectors. In the following years these constraints were loosened until 1996, when the maximum profit derived from investment banking was set at 25%, a limit so high that almost every bank could afford to stay within it[20]. The last and definitive strike on the Glass Steagall Act was in 1999, when Congress passed the Financial Modernization Act[21], also known as the Gramm-Leach-Bliley Act, which cancelled the separation between banking sectors.

The repeal of the Glass Steagall Act and the deregulation wave of the eighties led to many consequences which are still being discussed: the modernization of finance saw the developing of new derivatives and their proliferation, such that the unregulated financial market went from a total

[16] «H.R.6267 - 97th Congress (1981-1982): Garn-St. Germain Depository Institutions Act of 1982 | Congress.gov | Library of Congress», s.d., https://www.congress.gov/bill/97th-congress/house-bill/6267.
[17] «Garn-St Germain Depository Institutions Act of 1982 | Federal Reserve History», s.d., https://www.federalreservehistory.org/essays/garn-st-germain-act.
[18] «(PDF) Financial industry deregulation in the 1980s», s.d., https://www.researchgate.net/publication/23529559_Financial_industry_deregulation_in_the_1980s.
[19] «12 U.S. Code § 3801 - Findings and purpose | U.S. Code | US Law | LII / Legal Information Institute», s.d., https://www.law.cornell.edu/uscode/text/12/3801.
[20] M. Sherman, *op.cit.*
[21] *GRAMM-LEACH-BLILEY ACT*, 2000.

traded derivatives nominal value of 106 trillion dollars in 2001 to a total nominal value of 531 trillion dollars in 2008.[22]

1.4 Link between financial deregulation and Efficient Market Hypothesis

As we saw earlier in the chapter, there is a clear link between the wave of market deregulation started in the eighties and the liberal (and liberist) ideological background of the USA, which found its main workhorse into the Efficient Market Hypothesis. Many regulative acts shown early in the chapter (if not all of them), were often touched and shaped by ideological biases which alternately pushed the limits to the free market back and forth, depending on which side was leading at the time. For instance, Usury Laws' birth and consensus was due partly to the public opinion's aversion towards usury, but this aversion was not cost free: the ceilings on interest rates proved to be an irrational inefficient restriction on the free market[23]. After the Great Depression of 1929 the general consensus was to impose more regulations on banking activities and financial transactions, but again this attitude weakened in the eighties with the wave of deregulation. Let us see why.

The United States have a strong tradition of liberalism, inherited from the same enlightenment ideals that moved the American Revolutionary War and constituted their founding principles in both the US constitution and the declaration of Independence. The ideological outcome of this revolution shaped the American culture in its entirety by putting freedom, of thought, of expression, of religion and of enterprise (which is the main focus of this chapter) as the highest ranked value. Every cultural movement originated in the United States thereafter was focused on the absolute importance of the individual rights of every citizen. Americans see in any state imposition the ghost of the British crown, and this terror was later poured into the battle against communism. The American liberalism in economics gave life to the Chicago School of Economics, a movement started in the 30s by Frank Hyneman Knight, that claimed famous exponents such as Nobel prizes Milton Friedman and Eugene Fama, or the former FED Chairman Alan Greenspan. The economists of the Chicago School believed the state's intervention on markets to be detrimental to the economy: this principle, applied to finance, translates into a policy of banking and financial deregulation. Alan Greenspan played a pivotal role as he took Volcker's place in the leadership of the FED and prosecuted his policy of deregulation: he was an objectivist, the philosophical doctrine founded by writer Ayn Rand. We highlight this detail

[22] M. Sherman, *op.cit.*
[23] «The Uniform Small Loan Law»cit.

because objectivism is an hardcore libertarian doctrine, emblematic of the Chicago School's current of thought.

But the idea underpinning financial deregulation is something more than pure ideology: in facts, it is based on the assumption that financial markets are efficient and allocate resources in an optimal way. The Efficient Market Hypothesis states that, in an efficient market, stock prices fully reflect all the available information, and so they are a good indicator of the intrinsic value of the firm. Hence, abnormal (excessive) returns are not possible, and no one can consistently beat the market. Another assumption made by the Efficient Market Hypothesis is that past prices offer no useful indication of what future prices will be, making them unpredictable in the short term and, again, confirms that it is impossible for anyone to derive excessive returns from the market. The theory has been the central proposition for finance from the year of its first formulation in 1970 by Eugene Fama in his book "Efficient Capital Markets: A Review of Theory and Empirical Work". But in the EMH, not only markets must be efficient: the agents of this model have to be rational too, unbiased and flawless. This last model of perfectly rational agents is outdated and currently being dismissed by modern finance, which recognize the existence of psychological biases.

> *"…proponents of the classical EMH argue that there are limits to the degree and persistence of behavioural biases such as inconsistent probability beliefs, and substantial incentives for those who can identify and exploit such occurrences. While all of us are subject to certain behavioural biases from time to time, according to EMH supporters market forces will always act to bring prices back to rational levels, implying that the impact of irrational behaviour on financial markets is generally negligible and, therefore, irrelevant. But this last conclusion relies on the assumption that market forces are sufficiently powerful to overcome any type of behavioural bias, or equivalently that irrational beliefs are not so pervasive as to overwhelm the capacity of arbitrage capital dedicated to taking advantage of such irrationalities.*"[24]

Assuming the perfect rationality of the agents in a system, Game Theory already suggests that the rational individuals who take decisions and adopt optimal strategies do not always end up with the best possible outcome, In other words, agents making decisions according to their personal interests might damage the whole system (comprising themselves), going against what the theory of the Invisible Hand ("By pursuing his own interest [every individual] frequently promotes that of the society more effectually than when he really intends to promote it) suggested. That is the case of bank

[24] «(PDF) Efficient Markets Hypothesis», s.d., https://www.researchgate.net/publication/228319211_Efficient_Markets_Hypothesis.

runs and other games where the pursuit of the individual benefit creates an inefficient equilibrium. We will address these issues later in the paper.

Concluding, market efficiency is an essential precondition for financial deregulation, and only the trust of US's institutions in the EMH and market rationality could have allowed such a policy to take place. We saw how many factors contributed to induce legislators to adopt deregulation:

- the economic conditions, and high inflation in the 70s;

- the pressure from financial markets, banks and other institutions;

- the soundness of financial markets at the time and the consequent confidence that a new financial crisis was impossible;

- the cultural and ideological environment;

- the mainstream economic theory of the time, the Chicago School of Economics, backed by the Efficient Market Hypothesis;

The influence of EMH on American finance, however, cannot be reduced to a wave of deregulation. EMH's focus on the importance of information in the process of valuing a firm's price stock: more information help investors make better transactions, while information asymmetry might produce arbitrage opportunity and infringe market efficiency. The EMH influenced the SEC (Security and Exchange Commission) over the years to impose disclosure requirements[25] in order to provide investors with reliable information. The idea behind this policy was to ease the pression on financial institutions in exchange for disclosure requirements.

> *"The radical deregulation of financial markets after the 1970s was a precondition for the explosion in size, complexity, volatility and degree of global integration of financial markets in the past three decades. It therefore contributed to the severity and breadth of the recent global financial crisis. It is not likely that deregulation would have been so extreme and the crisis so threatening had most financial economists adopted Keynes Minsky financial market theory, which concludes that unregulated financial markets are inherently unstable and dangerous. Instead, they argued that neoclassical efficient financial market theories demonstrate that lightly regulated generate optimal security prices and risk levels, and prevent booms and crashes. Efficient market theory became dominant in spite of the fact that*

[25] The Harvard Law School Forum on Corporate Governance, «Efficient Markets and the Law: Predictable Past and Uncertain Future», *https://corpgov.law.harvard.edu/*, ottobre 2012, https://corpgov.law.harvard.edu/2012/10/01/efficient-markets-and-the-law-predictable-past-and-uncertain-future/.

it is a fairly-tale theory based on crudely unrealistic assumptions. It could only have been adopted by a profession committed to Milton Friedman's fundamentally flawed positivist methodology, which asserts that the realism of assumptions has no bearing on the validity of a theory. Keynes argued persuasively that only realistic assumptions can generate realistic theories. Keynes-Minsky theory, which is derived from a realistic assumption set, should be the profession's guide to regulation policy."[26]

1.5 Accountability for the Great Recession: why financial deregulation was the main contribution factor of the Global Financial Crisis

Financial regulators could hardly keep the pace with the constant financial growth and innovation of the 2000s, and nobody saw (or, as we will see later, closed an eye on) the inflating bubble in the housing market. The absence of a restrictive regulation brought new types of alternative mortgages, many of them being issued with no surveillance over the borrowers' credit. Unreliable borrowers could rent houses that they would not be able to pay in the future, but the risk could be evaded by securitization[27]. The resulting ABS (Asset Backed Securities), which in this case should be referred to as MBS (Mortgage Backed Securities) were widely spread across the financial system but, although considered safe investments, they lost their value in 2008 with the decline of the housing market and the default of their related mortgage house loans. The reason why no one realized a crisis was rating agencies[28], the institutions designed to monitor and supervise the creditworthiness of a business, who conveniently ignored the risk behind MBS.

The timing of the Global Financial Crisis of 2008 perfectly fits with the peak of the financial deregulation that America was undergoing. The financial bubble of the housing sector is probably the biggest example (the hugest possible) of market anomaly in the recent history, and its inconsistency with the Efficient Market Hypothesis has weakened the neoliberal hegemony over financial theories in favour of other theories such as Keynesian and behavioural economics[29]. Surprisingly, Economics'

[26] James Crotty, *The Realism of Assumptions Does Matter: Why Keynes-Minsky Theory Must Replace Efficient Market Theory as the Guide to Financial Regulation Policy*, s.d., https://scholarworks.umass.edu/econ_workingpaper.
[27] Zachary S Gilreath, *The Culprit of the Great Recession: A Detailed Explanation of Mortgage-Backed Securities, their Impact on the 2008 Financial Crisis, and the Legal Aftermath Recommended Citation*, *Journal of Business & Technology Law*, vol. xiii, 2018.
[28] «The Indisputable Role of Credit Ratings Agencies in the 2008 Collapse, and Why Nothing Has Changed», s.d., https://truthout.org/articles/the-indisputable-role-of-credit-ratings-agencies-in-the-2008-collapse-and-why-nothing-has-changed/.
[29] Wyn Grant, Graham K. Wilson, *The Consequences of the Global Financial Crisis: The Rhetoric of Reform and Regulation*, *The Consequences of the Global Financial Crisis: The Rhetoric of Reform and Regulation*, Oxford University Press, 2012.

Neoliberalism did not undergo the same process of theoretical substitution or innovation which is typical of economics, especially for flawed models[30], but we saw a radical change of direction in the

> *"Federal deregulation permitted lenders to charge a risk premium to less creditworthy borrowers in the form of higher interest rates and fees. Equally importantly, deregulation allowed lenders to market new and more complex types of mortgage products, including adjustable-rate mortgages and loans with balloon payments and negative amortization, which expanded the pool of eligible borrowers and helped lenders control for interest-rate risk."*[31]

The Repeal of the Glass Steagall act contributed to the Great Recession[32]: without its repeal, the spread of the crisis would have been much more contained into the single banking sectors. The separation between investment and thrift was crucial in order to avoid these kind of problems, the chain reaction of a bank failing and taking all the others with her, like what happened in the 1929. For the same reason, thrift banks could not engage in risky investment activities, in order to not endanger deposits. The spread of the crisis was so huge that many other international banks all around the world went bankruptcy together with American ones. So, the bubble's consequences went over the house market's boundaries.

Another reason why Glass Steagall Act should not have been repealed, is the overlapping of two conflictual positions for banks. The conflict of interest lies in banks assuming both the role of creditors and lenders. The risks of repealing the Glass Steagall Act, however, were already known years before the Fed finally ended it. In 1987, the Congressional Research Service prepared a study outlining the positives and negatives for preserving The Glass-Steagall Act. The following is an excerpt from the report:

> *"The Case for Preserving the Glass-Steagall Act:*
>
> *1. Conflicts of interest characterize the granting of credit - lending - and the use of credit - investing - by the same entity, which led to abuses that originally produced the Act.*

[30] Graham K. Wilson, Wyn Grant, «Introduction», *The Consequences of the Global Financial Crisis: The Rhetoric of Reform and Regulation*, Oxford University Press, settembre 20, 2012.
[31] Patricia A Mccoy, Elizabeth Renuart, *The Legal Infrastructure of Subprime and Nontraditional Home Mortgages*, 2008.
[32] Corinne Crawford, *The Repeal Of The Glass-Steagall Act And The Current Financial Crisis*, *Journal of Business & Economics Research*, vol. ix, 2011.

2. Depository institutions possess enormous financial power, by virtue of their control of other people's money. Its extent must be limited to ensure soundness and competition in the market for funds, whether loans or investments.

3. Securities activities can be risky, leading to enormous losses. Such losses could threaten the integrity of deposits. In turn, the Government insures deposits and could be required to pay large sums if depository institutions were to collapse as the result of securities losses.

4. Depository institutions are supposed to be managed to limit risk. Their managers, thus, may not be conditioned to operate prudently in more speculative securities businesses...

The case against preserving the Glass-Steagall Act:

1. *Depository institutions will now operate in "deregulated" financial markets in which distinctions between loans, securities, and deposits are not well drawn. They are losing market shares to securities firms that are not so strictly regulated and to foreign financial institutions operating without much restriction from the Act.*

2. Conflicts of interest can be prevented by enforcing legislation against them and by separating the lending and credit functions through forming distinctly separate subsidiaries of financial firms.

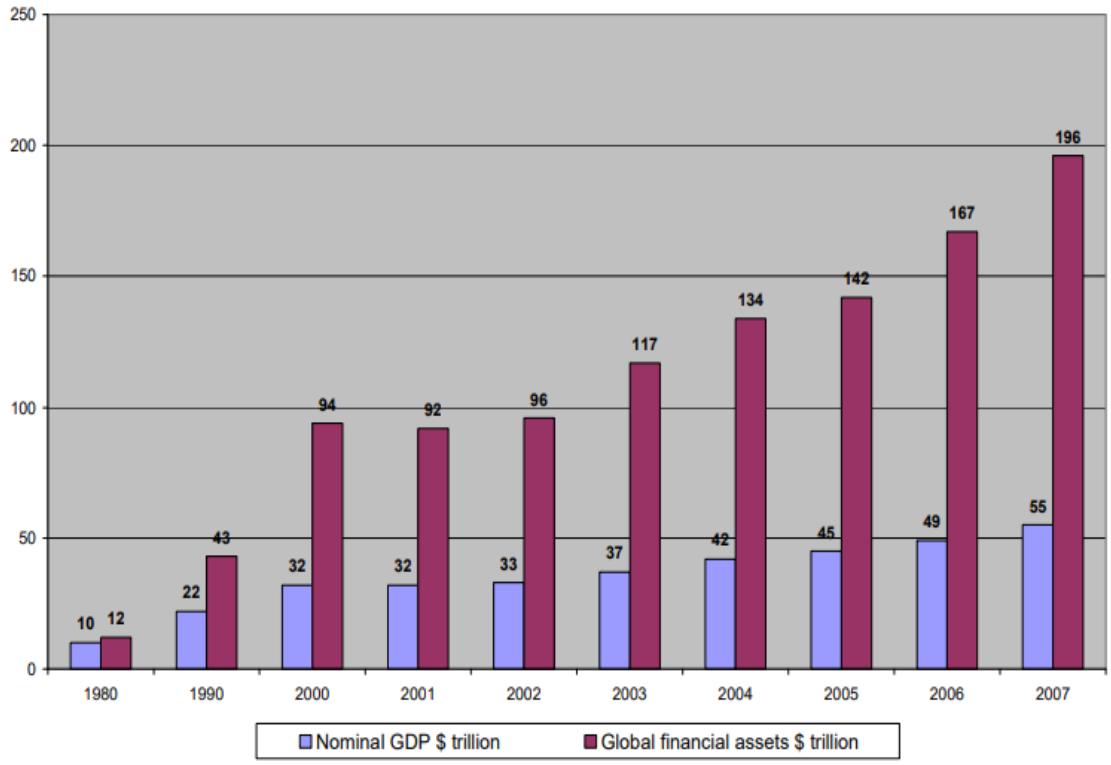
3. The securities activities that depository institutions are seeking are both low-risk, by their very nature, and would reduce the total risk of organizations offering them, by diversification.

4. In much of the rest of the world, depository institutions operate simultaneously and successfully in both banking and securities markets. Lessons learned from their experiences can be applied to our national financial structure and regulation." [33]

Together with the repeal of the Glass Steagall, many other acts are seen as contributors to the 2007 subprime crisis, like the Alternative Mortgage Transactions Parity Act of 1982 (AMTPA) [34] and the Garn-St Germain. By allowing new forms of mortgages, with new elaborated forms of payment, they set the basis for the subprime disaster. After the securitization of these mortgages, the issuers could evade the risk of insolvency and sell risky assets at unfair prices thanks to the collusion with the credit score rating agencies. This issuance of new financial instruments, as we can see in the table, reached

[33] William D. Jackson, *Glass-Steagall Act: Commercial vs. Investment Banking*, Library of Congress. Congressional Research Service., giugno 29, 1987, https://digital.library.unt.edu/ark:/67531/metacrs9065/.
[34] «How Congress set up the subprime mess - Jan. 31, 2008», s.d., https://web.archive.org/web/20090425222614/https://money.cnn.com/2008/01/30/real_estate/congress_subprime.fortune/.

its peak right before the subprime crisis and financial assets grew four times more than GDP. This process of creating artificial wealth separately from real wealth is called "financialization".



Source: McKinsey Global Institute.

[35]

1.6 Institutional failure: "Too big to fail" and the Credit Rating Agencies'(CRAS) scandal

> *"What has the past taught and what does the future offer? Apparently, many have learned little from the past because Dodd-Frank is attacked as excessive regulation when, in reality, it did not go far enough. Supposedly the era of too big to fail is over; however, this is not a view held by, for example, Standard & Poor's, which has indicated its concern that future*

[35] Luiz Carlos Bresser-Pere, «The Global Financial Crisis and a New Capitalism?», *SSRN Electronic Journal*, gennaio 2012, https://papers.ssrn.com/abstract=1605180.

bailouts may be in the offing. Nor did Dodd-Frank adequately deal with the misaligned incentives that motivated bank management to take catastrophic risks."[36]

The Too Big To Fail problem came out when Lehman Brothers and other investment banks failed[37]. The government knew what the consequences of these bankruptcy were: a vicious endless cycle of bankruptcies and economic regression which, if left uninterrupted, would have destroyed American economy. Few banks were so big that their insolvencies alone would have caused the whole economy to follow in the fall. The US government had to save those banks with taxpayers' money in order to save the situation. But there was a collateral side effect: if the government saved those banks from their own failure, intervening into the free market as a *Deus ex machina,* it would have created a risky precedent: this intervention would have demonstrated that those banks were too important to be left on their own, raising their bargaining power over the government. Knowing that the government would never let them fail, and that taxpayers' money will always be there to save them, investment banks would have started to engage in risky projects, basically running for the highest returns without paying any risk. This was unacceptable also from an ethic point of view, since this policy is incoherent with the idea of freedom of enterprise expressed by American Libertarianism, where state's interventionism in capital markets is both undesirable and inefficient. The government followed the decision of saving those banks too big to fail, except for Lehman Brothers.

The second big Institutional failure was the great scandal of credit rating agencies. The conflict of interest was in rating agencies being assumed and paid by the same clients they were supposed to rate. The result was a collusion between those institutions, that flawed the transparency of the whole system. The reasons that made it possible were:

- The absence of competition in the sector, with the only rating agencies being Standard&Poors, Moody's and Fitch;

- The difficult process of risk assessing adopted by each agency, which made it difficult for controls to be made;

- Conflict of interests that we already mentioned.

[36] Damon Silvers, Heather Slavkin, *The Legacy of Deregulation and the Financial Crisis: Linkages Between Deregulation in Labor Markets, Housing Finance Markets, and the Broader Financial Markets Recommended Citation*, *Journal of Business & Technology Law*, vol. iv, 2009.
[37] Charles W Murdock, *The Big Banks: Background, Deregulation, Financial Innovation, and 'Too Big to Fail, ' Part of the Banking and Finance Law Commons, and the Securities Law Commons*, s.d., http://lawecommons.luc.edu/facpubs.

The absence of regulation put banks into situations that were too risky to be. The financial and economic system cannot bear this sort of bets with stakes so high. Assuming that markets are irrational (as we will see soon) and that the outcomes of a deregulated market are as unpredictable and dangerous, we conclude that the best interest for the system as a whole is to interpretate financial regulation as the boundary of where competition must not go forth. The effects of deregulation and lack of supervising do not revolves solely around the risk of financial crises, which is by itself a valid reason to beware of excessive deregulation, but also around the creation of collusion, corruption, oligopoly, moral hazard and abuse of power. From the next chapter we will analyse the theories about dynamics of human behaviour and what forces shape them.

Chapter 2

History of Behavioural Finance and the confutation of the Efficient Market Hypothesis

2.1 Before behavioural finance and behavioural economics: the psychological approach to economics

The study of human behaviour has always been of huge interest for philosophers, mathematicians, statisticians and scientists in general. Such importance lies on the multiple applications, consequence and implications that the knowledge of how humans take decisions can have. Today, the study of this branch of knowledge is well recognized and taken into account by psychologists, doctors, historians, social scientists, political analysts and economists, proving that the contribute given by this subject is extremely eclectic. That was not always the case in economics: for many decades, this idea was never even taken into consideration, but ignored in favour of quantitative models which relied on mathematics and logic. While still accepting the importance of quantitative studies, it is undeniable that, where quantitative models failed to provide solutions or explanations to inconsistencies, psychology gained more and more consideration as a tool of scientific research. The study of human decision making process is called "Decision Theory". A crucial point of the "Decision Theory", in economics particularly, has always been how to consider the agents in a model and how do these models adapt to reality. In other words: should agents (the entities making decisions) be considered as rational? And if so, are human fully rational? Well, Decision Theory is divided into two different branches: normative decision theory, which studies what are the best solutions for a problem, a game, a dilemma or a bet, and descriptive decision theory, which studies the actual decisions made by humans in those situations. One of the most relevant contributes to this theory comes from the Game Theory, but the first steps into the field were made many centuries ago.

Expected value was the first attempt to explain the decision making process in a rational form: it was invented in 1607 by Huygens and allows to sum up the expected gain of each possible outcome with a trivial computation. But, however trivial the computations might be, its practicality was soon put in doubt by some inconsistencies: the Saint Petersburg paradox, invented by Daniel Bernoulli, was a mathematical demonstration of how a perfect mathematical computation was hardly an exhaustive way to produce practical solutions in the real world, let alone a predictive tool for human decisions. The paradox describes an infinitely repeated game with a microscopic, almost inexistent, chance of

infinite gains, which has by result an infinite expected value. Computations suggest that a rational player would gladly invest all his money on the game, but in reality no one would ever consider to spend so much on a bet like that. The reason is that the real world has many more constraints than money, and humans have a certain degree of risk taking aversion.[38]

This psychology aversion was prosecuted by neoclassical economists, who are now regarded as the mainstream orthodox economists, and are mainly responsible for the mathematization of economics. As Roy Weintraub writes:

> *"The very term "social system" is a measure of the success of neoclassical economics, for the idea of a system, with its interacting components, its variables and parameters and constraints, is the language of mid-nineteenth-century physics. This field of rational mechanics was the model for the neoclassical framework. Agents were like atoms; utility was like energy; utility maximization was like the minimization of potential energy, and so forth."*[39]

Nevertheless, neoclassical economists themselves always admitted the importance of individuals' psychology into decisions. Adam Smith himself can paradoxically be seen as both an exponent of "mathematical economics" and the inventor of behavioural economics for his theory of moral sentiment and his views abut the importance of human psychology. He was not the only one, many other economists often resorted to psychological explanations for economical problems, but this approach was never explored deeply enough to provide any determinant solution.

2.2 Behavioural Economics

Behavioural economics derives from the clash between this model of purely mathematical economics and psychology. It is very difficult to assess a date of birth and a father, since its importance went on manifesting itself slowly in the post WWII years, thanks to the contribution of many social scientists, but we know for sure that behavioural economics was born as a result to the need of validating the theory of expected utility. The theory of expected utility, although being an important microeconomics' tool for the comprehension of basic concepts, like the preference between different

[38] Pavlo Illiashenko, «Behavioral Finance: History and Foundations», *Visnyk of the National Bank of Ukraine*, fasc. 239, marzo 2017, pp. 28–54.
[39] «Neoclassical Economics, by E. Roy Weintraub: The Concise Encyclopedia of Economics | Library of Economics and Liberty», s.d., https://www.econlib.org/library/Enc1/NeoclassicalEconomics.html.

goods, it is widely considered as a solely theoretical idea. Together with the concept of marginal utility it measures the subjective preferences of individuals over certain goods by directly comparing them and assessing a preference between two or many of these goods. The theory of expected utility falls into the normative branch of the Decision Theory, and describes an economic model of rational choice, the leading approach of the neoclassical view. The first critics of the theory of expected utility were in fact the leading promoters of behavioural economics[40], developing an alternative model of studies on individual behaviour. We can say this approach to be deductive, rather than inductive, for behavioural economics was based on the empirical evidence that the existing models, like expected utility, failed to explain. The systematic deviations of the real world economy and the many studies done on the subject led to the conclusion that utility is not an exhaustive way of predicting human choice. Humans do not take decisions only by choosing more over less and taking risk into consideration: we are driven by biases, sensations, sentiments, instinct and patterns, we are easily tricked, we usually do not have enough information on the decisions we have to make and, finally, we have concerns on hardly quantifiable matters, such as beliefs.

On the contrary, agents in neoclassical economy are based on the Homo Economicus Model, the perfectly rational human being. Unfortunately, rationality in this model has just a computational value, and in recent years this approach has been criticized for having many shortcomings in the understanding of the human's behaviour**[41]**. Neoclassical purely mathematical models proved insufficient, so they had to be implemented by exhaustive studies on the human behaviour, which abandons the idea of agents being of homo economicus' rational entities and embraces the view of humans being "irrationals", in the sense that they (we) tend to be biased and influenced by many non mathematical factors[42]. The rational homo economicus has always lacked of empirical support, practical understanding of the real worlds dynamics, and too much computational ability was attributed to individuals in economic models[43].One of these major exponents and promoters of the behavioural revolution was Simon Herbert, a strong detractor of the expected utility theory, whose contribute is unanimously recognized as the start of behavioural economics[44].

[40] Michiru Nagatsu, «Behavioral Economics, History of», *International Encyclopedia of the Social & Behavioral Sciences*, Elsevier, 2015, https://linkinghub.elsevier.com/retrieve/pii/B9780080970868030531, pp. 443–449.
[41] Domènec Melé, César González Cantón, «The Homo Economicus Model», *Human Foundations of Management*, Palgrave Macmillan UK, 2014, pp. 9–29.
[42] Herbert A Simon, *A Behavioral Model of Rational Choice*, *Source: The Quarterly Journal of Economics*, vol. lxix, 1955.
[43] KENNETH J. ARROW, «RISK PERCEPTION IN PSYCHOLOGY AND ECONOMICS», *Economic Inquiry*, vol. 20, fasc. 1, 1982, pp. 1–9.
[44] Herbert A. Simon, *Models of man: social and rational; mathematical essays on rational human behavior in society setting.*, New York, Wiley, 1957.

Prospect Theory is the name of the behavioural counterpart of the Expected Utility. Instead of taking into account the normative side of decision, it focuses on the descriptive side, the real decisions taken by individuals in situations of risk. Prospect theory includes the description of a set of psychological rational biases that influence human behaviour. It was developed by Daniel Kahneman and Amos Tversky in 1979[45].

2.3 The Behavioural Finance Revolution: the answer against the Efficient Market Hypothesis [46] [47]

Behavioural finance's birth is easier to date in time: just as behavioural economics, behavioural finance was introduced by highlighting the market anomalies and providing a scientific explanation. As behavioural economics opposed the Expected Utility Theory, behavioural finance moved its first steps at the expense of the Efficient Market Hypothesis. It is worth highlighting the fact that the birth of Behavioural Finance was somehow contemporary to the beginning of financial deregulation. The unanimously recognized fathers of behavioural finance, researchers De Bondt and Thaler, published a scientific paper in 1985 about the stock market overreaction[48]: the paper showed that investors' overreactions to news events, which is not consistent with the Bayes rule, had an impact on market prices. Those years were characterized by a huge rise of financial transactions and it is estimated that stock prices in 1985 were inflated by the 10%[49]. These information, together with the knowledge of the subsequent events of 2008, suggests that something happened to financial markets. In 1979, deregulation on interest rates started an abnormal increase in long term interest rates, together with a wave of speculation[50]. The idea is that this growth in anomalies financial markets was triggered by the early stages of deregulation that were happening at the time. Financial deregulation, after all, might have been one of the greatest contributing factors to the birth of behavioural finance: the many anomalies produced in this period of time were used as a demonstration of market inefficiency and

[45] Daniel Kahneman, Amos Tversky, «Prospect theory: An analysis of decision under risk», *Experiments in Environmental Economics*, vol. i, Taylor and Francis Inc., 2018, pp. 143–172.
[46] «Behavioral Finance: Psychology, Decision-Making, and Markets | Request PDF», s.d., https://www.researchgate.net/publication/311573978_Behavioral_Finance_Psychology_Decision-Making_and_Markets.
[47] Nicholas Barberis, Richard Thaler, *A Survey of Behavioral Finance*, Cambridge, MA, settembre 19, 2002, http://www.nber.org/papers/w9222.pdf.
[48] WERNER F. M. De BONDT, RICHARD THALER, «Does the Stock Market Overreact?», *The Journal of Finance*, vol. 40, fasc. 3, luglio 1985, http://doi.wiley.com/10.1111/j.1540-6261.1985.tb05004.x, pp. 793–805.
[49] «1985--A Year of Easy Money in Stock Market : Dow Surges to Its Best Annual Gain Since 1975 - Los Angeles Times», s.d., https://www.latimes.com/archives/la-xpm-1986-01-02-fi-23654-story.html.
[50] Leonard A. Rapping, Lawrence B. Pulley, «Speculation, deregulation, and the interest rate», *American Economic Review*, American Economic Association, maggio 1, 1985, pp. 108–113.

of the Efficient Market Hypothesis inconsistency, gathering the efforts for the rise of a financial theory based on psychology rather than pure rationality. Also, market anomalies produced by financial deregulation helped to amplify the pool of studies on market dynamics.

Speculation is driven by impression, trust and sentiments. The herding effect of financial markets can be studied by Behavioural Finance in order to understand its mechanics. In this sense, Keynes anticipated Behavioural Finance when he described it as a practice closer to a guessing strategy (or a guessing game) than a professional consideration. In order to explain the logic behind financial markets and their functioning, he elaborates the example of the beauty contest[51] where the winner is the one who guess who the other participants are going to vote rather than voting the nicest lady in the contest. Even if behavioural finance was not invented yet, we see in Keynes an acknowledgement of the importance of psychology in the understanding of future market's prices. He also recognizes the risk behind unethical speculation practices.

The General Theory of Employment, Interest, and Money, first published in 1936[52]:

> *"If I may be allowed to appropriate the term speculation for the activity of forecasting the psychology of the market, and the term enterprise for the activity of forecasting the prospective yield of assets over their whole life, it is by no means always the case that speculation predominates over enterprise. As the organisation of investment markets improves, the risk of the predominance of speculation does, however, increase. In one of the greatest investment markets in the world, namely, New York, the influence of speculation (in the above sense) is enormous. Even outside the field of finance, Americans are apt to be unduly interested in discovering what average opinion believes average opinion to be; and this national weakness finds its nemesis in the stock market."*

Nowadays, Behavioural Finance is still regarded as the anticonventional economic theory, compared to the discredited (but still valid) Efficient Market Hypothesis, but, nonetheless, it occupied its righteous place in the field[5354]. In 2017 Richard Thaler won the Nobel prize for economics for "integrating economy with psychology" [55].

[51] «Keynes's 'beauty contest' | Financial Times», s.d., https://www.ft.com/content/6149527a-25b8-11e5-bd83-71cb60e8f08c.
[52] John Maynard Keynes, *The General Theory of Employment, Interest, and Money*, 1936.
[53] *HERBERT SIMON SOCIETY Behavioral finance revolution and the financial regulations and policies Opening Remarks Salvatore Rossi Senior Deputy Governor of the Bank of Italy and President of IVASS*, s.d..
[54] «(No Title)», s.d., https://www.bancaditalia.it/pubblicazioni/interventi-direttorio/int-dir-2017/Rossi_Behavioral_Finance_Revolution_06122017.pdf.
[55] «The Prize in Economic Sciences 2017 - NobelPrize.org», s.d., https://www.nobelprize.org/prizes/economic-sciences/2017/summary/.

Behavioural finance do rejects the theory of perfectly rational individuals and rational markets, and, by consequence, rejects the calls for more deregulation since financial markets cannot be left unregulated if they tend to be irrational and inefficient [56].

2.4 The Efficient Market Hypothesis: point of strength and weaknesses behind its validity

Efficient Market Hypothesis focus largely on the importance of information in the pursuit of market efficiency, since phenomenon like inside trading may arise and cause unfair competition in financial markets, abuse of power and market monopolies. The guarantee to small traders for an efficient market is the unpredictability of market prices and investors dynamics, which offer everyone (in theory) almost the same chance of receiving returns. The only tool available to predict future prices is, in fact, information, but here it comes another issue: the availability of information and the absence of information asymmetry are both premises for the Efficient Market Hypothesis, but how realistic are them? Evidence suggests that both these conditions belong more to an abstract model rather than on a real market, questioning again the practicality of the Efficient Market Hypothesis[57]. The second premise of Efficient Market Hypothesis is perfect liquidity, which is another hypothetical and unrealistic condition for the market: financial assets, although being very liquid, are still far from being perfectly liquid due to their tradable nature, and subject to transaction costs that decrease their value as means of payment. The most relevant transaction cost in terms of time, liquidity and revenue is probably the intermediation of agents, who add to the matter the issue of agency problems. The need of agents is tied to the problem of information asymmetry. However, there is still no ground to completely dismiss the Efficient Market Hypothesis, because there is no absolute evidence on its invalidity, and some of its assumptions are still relevant. The problem of informational asymmetry is shown to be not relevant in the context on market performance just as much as the skills of agents are not worth their costs, or at least they do not grant an easy victory on the market. As Meir Statman explains:

[56] Robert J. Shiller, «From efficient markets theory to behavioral finance», *Journal of Economic Perspectives*, vol. xvii, 2003, pp. 83–104.
[57] *Ivi.*

> *"This issue becomes confused, however, when discussants fail to distinguish between two versions of efficient markets and their corresponding efficient market hypotheses the price-equals-value efficient market hypothesis and the hard-to beat efficient market hypothesis. And it remains a mystery why so many investors believe that markets are easy to beat."* [58]

In facts, Efficient Market Hypothesis has at least two different formulations:

-The first one trivially affirms that markets are efficient and stock prices fully reflect the intrinsic value of the firms. This first formulation is the easiest to dismiss, since the sole existence of financial bubbles, together with many other examples of anomalies (abnormal returns, arbitrage, et cetera…), is sufficient to discredit the hypothesis, or at least to generate doubts on its validity. The mechanism of speculation may drive prices in financial markets out of the expected rational price of their related stocks, just as an irrational herd of noise traders would do, in a way more similar to the herd of noise traders described by Keynes or by the Behavioural Finance rather than the Homo Economicus. The claim of this first formulation has lost ground in particular after the events of the Global Financial Crisis.

-The second one is still valid and undismissed: markets are efficient because they are hard to beat and nobody can derive consistent excessive returns from them. According to Fama, the same author of the Efficient Market Hypothesis, stock prices follow the path of a "random walk", and is impossible for investors to predict future prices based on past prices. The consequence is that it is impossible to outsmart the market, making it efficient in its returns distribution. The empirical surveys on the data tend to agree that the Random Walk Theory is still relevant nowadays and nobody is able to confute it. Even with the deeper understanding offered by Behavioural Finance and the modern scientific tools and researches there is no useful connection between past and future prices or any hint capable of suggesting the movements of stock prices. EMH's advocates use this formulation as a proof of the model soundness. There are two main evidences in favour of the EMH's strong form: the first is the good performances shown by passive investing strategies that emulate composite indexes such as S&P500[59]. Their good performance is due to the elimination of firms specific risks through diversification, which is in line with the EMH's predictions. Composite indexes are based the assumption that, since the stock price of a single firm is unpredictable, the best investment strategy is a well diversified portfolio that eliminates firm's specific risk and only deals with market risk. Another well known evidence in support of the EMH is the relative bad performance of mutual funds'

[58] Meir Statman, *The Second Generation BEHAVIORAL FINANCE*, 2019, www.cfainstitute.org.
[59] Burton G. Malkiel, «Passive Investment Strategies and Efficient Markets», *European Financial Management*, vol. 9, fasc. 1, marzo 2003, https://onlinelibrary.wiley.com/doi/full/10.1111/1468-036X.00205, pp. 1–10.

managers[60]. The concept is: if someone is able to outperform the market, these are professional managers who posses an higher level of knowledge and operate with better financial instruments than the average investor. The fact is that these professional managers do not outperform the market, but rather derive a normal return if compared with the cost of fees, transaction costs and agency costs. On the contrary we might say that this is quite the opposite.

Finally, there is one last problem that makes it impossible to reach a final conclusion on the EMH, which is related to a logical and computational fault in our formulas. One of the most important certifiable anomalies in finance is given by actual returns, which are, or should be, an useful tool in assessing a judgement on firms. We know that, according to the EMH, excessive returns are considered an anomaly in the model. Unfortunately, the EMH cannot be fully questioned since the only way to prove the existence of anomalies is by proving that a return is abnormal. Returns must be first discounted by their relative risk factor and opportunity costs of capital using the CAPM, but, unfortunately, risk factors are not easily quantifiable by computation. Even after returns are shown to be abnormally high, one could reasonably argue that the discounting factor for the return was miscalculated in the first place[61].

[60] Meredith Beechey, David Gruen, James Vickery, «The Predictions of the Efficient Market Hypothesis | RDP 2000-01: The Efficient Market Hypothesis: A Survey», *Research Discussion Papers*, fasc. December, dicembre 2000, https://www.rba.gov.au/publications/rdp/2000/2000-01/predictions-of-the-efficient-market-hypothesis.html.
[61] Andrei Shleifer, *Inefficient Markets, Inefficient Markets*, Oxford University Press, 2003.

Chapter 3

Implementation of Behavioural finance into financial regulation

3.1 Implementing regulations by understanding biases and agency problems

After the 2008 there has been a change of direction in the regulative policies' demand, both in and outside the US. Examples are the Basel III capital and liquidity rules for banks to maintain higher standards compared to the previous Basel II that lowered it; the European Solvency II Directive developing similar capital standards for insurance companies; and IFRS 9 (International Financial Reporting Standards) improving accounting rules by making asset and liability valuation more forward looking, incorporating elements of business models and expected losses. The impact of behavioural studies into the field of law and economics has been extremely influential, in particular in the adoption of the "nudging strategies"[62]. According to Thaler and Sunstein (2008, p. 6), a nudge is

> *"any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates. Putting the fruit at eye level counts as a nudge. Banning junk food does not."*[63]

The implementation of behavioural finance into law and regulation need three fundamental steps, which are:

- Research: as we already mentioned, Behavioural Finance offers a new microeconomic tool of analysis for real individual choices.

[62] Paul Ali, Ian Ramsay, Cate Read, «Behavioural Law and Economics: Regulatory Reform of Consumer Credit and Consumer Financial Services», *SSRN Electronic Journal*, novembre 2014, https://papers.ssrn.com/abstract=2524131.
[63] PETER KING, «Richard H. Thaler and Cass R. Sunstein (2008), Nudge: Improving Decisions about Health, Wealth and Happiness. London: Yale. £18, pp. 293, hbk.», *Journal of Social Policy*, vol. 38, fasc. 4, ottobre 2009, https://www.cambridge.org/core/journals/journal-of-social-policy/article/abs/richard-h-thaler-and-cass-r-sunstein-2008-nudge-improving-decisions-about-health-wealth-and-happiness-london-yale-18-pp-293-hbk/27D2BA672C5F01C1CB62C5DDADB3C0E1, pp. 726–727.

- Supervision: the comprehension of how humans work and react help institutional supervisors to monitor and predict banking and financial dynamics.

- Policy and Regulation: behavioural finance's understanding of concepts from psychology and Decision Theory in general provides better rules.

In order to create efficient regulations and policies, lawmakers must know what will be the outcome produced by their own actions, which, in some cases, is a counterintuitive side effect, non predictable via simple logic reasoning. These irrational behaviours, that not even professional investors are able to overcome, are the "psychological biases". Here is an example of the most common ones[64]:

> ***Representativeness bias****: which rates probabilities based on how elements to be compared resemble each other. Though this kind of stereotypical rating can be useful, it can also be a recipe for disaster "because similarity, or representativeness, is not influenced by several factors that should affect judgments of probability." Proper application of statistical calculations could counter stereotypical ratings.*
>
> ***Confirmation bias****: highlights how people want to see their own existing beliefs confirmed. Confirmation bias is "an irrational tendency to search for, interpret or remember information in a way that confirms preconceptions or working hypotheses. It is a type of cognitive bias and a systematic error of inductive reasoning." Causes can be found in "wishful thinking" (including interpreting the smallest of signs as concluding evidence) and/or strong emotional attachment to certain issues (such as in the areas of religious and political debate).*
>
> ***Anchoring****: relates to overdependence on first-offered information. Described by Tversky and Kahneman, and subsequently tested in a series of experiments, anchoring, or "focalism," highlights how people will depend too heavily on whatever the first set of data (that is, the "anchor") is that they receive, when making subsequent decisions. Its application can commonly be seen in marketplaces. In bargaining the initial listing price will be used as the anchor by the potential buyer, so that anything lower than the initial listing price will still seem as very reasonable, even though the actual worth of the item is (even) lower. Something similar applies to listed discount prices: the price tag listing an "original" price so the current*

[64] «A Behavioral Approach to Financial Supervision, Regulation, and Central Banking by Ashraf Khan :: SSRN», s.d., https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3236792.

price will give the potential buyer more of a "bargain feel," as it is anchored to the often much higher "original" price.

***Availability bias**: relates to the decision-making based on examples that come to mind immediately. It is grounded in the notion that if something can be recalled, it should be important. The availability heuristic limits the accuracy of predictions by focusing on events that the individual has experienced him/herself in the past.*

***Recency bias**: more recent events have stronger impact on our decision-making than older events.*

***Salience**: shows that real-life experiences create memories about facts that will be recalled more easily than if the same facts were noticed by other means ("seeing is believing").*

***"Imaginability"**: deals with the ability of imagining all the possible outcomes. This, especially in more complex situations, is a difficult task.*

***Action bias**: implies that people see any action—even if it would in fact be counterproductive to the goal set out to be achieved—as better than no action whatsoever.*

***Insensitivity to sample size**: seeing patterns where they do not exist is more common among gamblers, and possibly investment managers. It relates to the fact that people tend to see patterns in small numbers of results, even though the sampling theory entails that many results will more likely regress to the mean than a small set of results.* [65]

A perfect example of how the understanding of behavioural finance could help to understand and improve regulation is the Global Financial Crisis. Before the Great Recession's decline, financial markets underwent a period of high stock price volatility, general euphoria and overconfidence. All these phenomenon are psychological biases concerning the human behaviours rather than mathematical models. In particular, many of the biases we already mentioned could explain many of the events that set the GFC.

- Overconfidence: according to Nicholas Barberis, proponent of the Behavioural Finance overconfidence might be the cause of financial bubbles.

[65] *Ivi.*

- Mental Accounting: it could explain how the onset of financial crisis proceeded, how the panic immediately took place in Wall Street.

-Disposition effect: the tendency to sell immediately winner stocks but to keep losers in order to save the saveable. It incremented into Chinese financial markets during 2008 crisis. [66]

Another important issue to address for the corporate-banking lawmaker is the existence of agency problems, conflicts of interests between agents. In this case the agent is a professional (a lawyer, a broker, a financial analyst or a CEO), employed by a corporation, a bank or any financial institution, who must perform his tasks at the best of his abilities. Agency problems arise when agents are disincentivised to operate in good faith towards their employer and incentivised to not perform their tasks or either to perform it against their principal's interest. For example, the board of directors of a corporation might have all the interests to increase their own salary at the expense of the corporation. They might also decide to use the information obtained through their privileged position to trade corporate stocks and creating an information asymmetry. The practice of "inside trading" is extremely dangerous for financial markets as a whole, is an abuse of power, is unfair competition and since it does not obtain the best interest for the company, it goes to detriment of its shareholders. Corporate law perspective on the argument gives a multitude of examples on how agency problem may arise: the aim is to prevent agency problems to manifest by anticipating the possible behaviours of agents and by incentivising them to carry out their tasks loyally to their principal. The cost of agency problems, in terms of money, time and other transaction costs, is very high: corporations (which are personal entities), directors and shareholders might engage in dispendious lawsuits against each others, contracts with third parties might be difficult to deal with, and the efficiency of its operations might be infringed.[67]

From a banking and financial institutions point of view, the situation is similar but even more dangerous: the existence of agency problems might erode the trust financial agents, such as brokers and dealers. In general, borrowers and lenders relationship (which is the core of financial markets) has the intrinsic need for a guarantee, either by private contract or by institutional enforcement. Lenders cannot lend safely their savings without an entity enforcing the validity of contracts. The lesser the guarantees of property rights in general, the higher the risk for a lender, which translates into higher interest rates. At the same time, trustworthy borrowers have all the interest to bargain with

[66] «A Behavioral Finance Perspective of the 2008 Financial Crisis», s.d., https://www.linkedin.com/pulse/behavioral-finance-perspective-2008-financial-crisis-mayuresh-jaiswal.
[67] Paul L Davies, *GOWER AND DAVIES' PRINCIPLES OF MODERN COMPANY LAW EIGHTH EDITION*, s.d.

lenders under legal supervision, since rates of returns will drastically decrease and the likeability of a loan get solider. [68]

For financial institutions, the risk is even bigger: the lack of trust towards financial institutions can be brought into existence by agency problems, which have already happened to cause immense damages several times in the course of the recent decade. The great scandal of rating agencies during the Global Financial Crisis was a huge agency problem between the agent, rating agencies, and the third parties mislead by the bad ratings [69].

3.2 Central Banking role in the process of Financial Supervision and monitoring

Central Banks can apply Behavioural Finance in its policies by expanding the current knowledge on behaviour into financial markets and correcting old wrong assumptions. Behavioural finance in particular has revealed to be extremely useful in microeconomic models, with no direct influence over the macro environment, which is the main competence field of central banking. At the moment, macroeconomic models are being implemented with microeconomic insights from behavioural finance. .[70] For example, in the current leading model, the new Keynesian, shock from monetary policy is immediate, while we know from empirical evidence that economy takes a very long time. Behavioural finance has provided evidence that not all actors in the economy are 'fully rational' and this has influenced models of asset pricing on which part of the monetary policy transmission mechanism depends. Such uncertainty about the behaviour of asset prices has in part stimulated a move towards 'robustness', as an important criterion for guiding monetary policy.[71] Behavioural Finance in general can be useful in studying consumption patterns, choices and preference in general, all macroeconomic concepts.

The most important international accord on central banking financial supervision is the Basel. There have been three different G10 meetings where the Basel accords have been issued with Basel I in

[68] Emilios Avgouleas, «The Global Financial Crisis, Behavioural Finance and Financial Regulation: In Search of a New Orthodoxy», *Journal of Corporate Law Studies*, vol. 9, fasc. 1, aprile 2009, pp. 23–59.
[69] Reinier Kraakman et al., *The Anatomy of Corporate Law*, *The Anatomy of Corporate Law*, Oxford University Press, 2017.
[70] John C. Driscoll, Steinar Holden, «Behavioral Economics and Macroeconomic Models», 2014.
[71] Stuart Hyde, Keith Cuthbertson, Dirk Nitzsche, «Monetary Policy and Behavioral Finance», *SSRN Electronic Journal*, dicembre 2011.

1988, Basel II in 2004 and Basel III in 2017. The purpose of the three accords was to grant stability through a set of rules, standards and supervision for banks. Usually, banking legislation for stability require two main ingredients: liquidity and solvency. Liquidity is the first preventive safety measure act to protect banks from losses. Solvency is a financial goal aimed at protecting creditors from the risk of losing their savings, and is an ongoing monitoring operation that requires regulators to keep the pace with the constant financial innovation. Another criteria for financial fairness is transparency, which improves the reliability of banks and firms. Basel I established minimum common levels of capital for internationally active banks. The target standard ratio of capital to weighted risk assets was set at 8%, of which the core capital element had to be at least 4%. The Basel II accords later added to the basic Basel I restrictions some more advanced regulations, the so called "three pillars strategy", such as:

- Pillar 1, minimum capital requirements for credit risk, market risk, and operational risk;

- Pillar 2, supervisory review process, a framework for banks and a supervisory framework;

- Pillar 3, market discipline, disclosure requirements for banks.[72]

After the Global Financial crises, the Basel committee on banking supervision developed the Basel III accords in order to strengthen the already existing Basel regulations and making them more stringent by increasing capital requirements and introducing a minimum leverage ratio and a liquidity coverage ratio. The US implementation[73] of the Basel set of rules and standards has been introduced together with the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, which overlaps and cooperate, at the same time, with the Basel regulations[74].

3.3 Financial deregulation: the trade off between the benefit of growth and risk

Financial deregulation has shown a positive correlation with financial growth and economic growth[75]. Although being disputed and still debated, there are some facts that point in that direction. The period

[72] «Bank for International Settlements», s.d., https://www.bis.org/.
[73] Marx& Goodfiend, Robert G King, *FINANCIAL DEREGULATION, MONETARY POLICY, AND CENTRAL BANKING*, s.d.
[74] Darryl E Getter, *U.S. Implementation of the Basel Capital Regulatory Framework*, 2014, www.crs.gov.
[75] Geert Bekaert, Campbell R. Harvey, Christian Lundblad, «Does financial liberalization spur growth?», *Journal of Financial Economics*, vol. 77, fasc. 1, luglio 2005, pp. 3–55.

of time we have analysed, from the 80s to the 2008, offer no univocal answer: there is the problem of addressing the two major crisis of American economy in those years, the Great Recession and the savings and loan crisis. But it is irrefutable that the same period, financial crisis aside, saw a consistent economic growth, which, at the same time was hardly caused by just one factor. Scientific literature suggests that financial deregulation might be the cause of the economic growth of the 80s: Jith Jayaratne and Philip E. Strahan[76] analysed in different studies how the bank branching deregulation was a positive contributor to economic growth. Here is explained the mechanism:

> *"Banking deregulation of restrictions on branching and interstate banking lifted a set of constraints that had prevented better-run banks from gaining ground over their less efficient rivals. Big changes in the banking industry followed deregulation: many acquisitions and consolidation, integration across state lines, and a decline in the market share of small banks. These changes allowed banks to offer better services to their customers at lower prices. As a result, the real economy – "Main Street" as it were – seems to have benefitted. Overall economic growth accelerated following deregulation, and this faster growth seems to have been concentrated among new businesses. Sometimes we think that higher returns necessarily come at a the cost of greater risk, but in the case of U.S. banking deregulation, volatility of the economy declined as growth went up."*[77]

Many studies also confirm the positive link between financial growth and economic growth. A survey from the ECB research commission [7879] reviewed an exhaustive amount of the most relevant papers on the subject, and concluded that they all seem to arrive at the conclusion that financial markets and the real economy are positively connected. The interpretation of this correlation between financial deregulation and financial growth lies in the creation of new financial instruments that create new investment, lending and borrowing opportunities, also risky one as the subprime mortgages. Financial innovation of the early 2000s could not have happened if it was not for the lack of restrictions imposed on mortgages. The Italian scientific paper by D'Onofrio, Minetti and Murro[80] investigate how local banking development affects income distribution by mitigating income equality. The role of finance is to best allocate resources by creating a channel between investors and lenders, and permits lenders

[76] J. Jayaratne, P. E. Strahan, «The Finance-Growth Nexus: Evidence from Bank Branch Deregulation», *The Quarterly Journal of Economics*, vol. 111, fasc. 3, agosto 1996, https://academic.oup.com/qje/article-lookup/doi/10.2307/2946668, pp. 639–670.
[77] Philip E Strahan, *THE REAL EFFECTS OF U.S. BANKING DEREGULATION**, 2002.
[78] «(No Title)», s.d., https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2115.en.pdf.
[79] Alexander Popov, *Working Paper Series Evidence on finance and economic growth*, s.d.
[80] Alexandra D ' Onofrio, Raoul Minetti, Pierluigi Murro, *CERBE Banking development, economic structure and income inequality Banking development, economic structure and income inequality*, 2016, https://sites.google.com/site/cerbelumsa/home.

to put at good use their money, that otherwise would have remained out of the economy, and borrowers to finance their investments.

Conclusions

By examining the history of the US financial markets keeping an eye on the degree of deregulation of each period, we found that when periods of high deregulation are followed by high stock price volatility, market anomalies, overconfidence and, finally, a financial crisis. But this correlation alone would not be sufficient to establish a nexus of causation. So, we analysed what we think were the main contributors of the speculative bubbles: Federal Acts, which were all appositely designed to be a deregulative legislation. This is confirmed both by the signatories of those acts, both by the analysts. Some of these Acts specifically allowed the creation of the same debt instruments, subprime mortgages, that caused the crisis of 2008 in the same sector these mortgages were applied, housing. Some economists even predicted the dynamic of the crisis more than 20 years before it happened (Minsky), leading to the conclusion that deregulation might in facts be the cause of the crisis, and its application in general is detrimental to the economy. We investigated even more about deregulation, proving that it originates from the American libertarian neoclassical school of thought of economic, which legitimates the lack of stricter regulations with the EMH. Then we introduced the Behavioural Finance and confronted it with the EMH: data and market anomalies demonstrate the empirical inconsistency of the latter, confuting also the premise of perfect rationality as theoretical explanation of the data about market anomalies. Lastly, we applied the tenets of BF into legislation in order to remedy at the errors committed in the past.

The goal of the thesis is to draw a line from deregulation to Behavioural Finance, passing through Efficient Market Hypothesis. It is maybe common knowledge how deregulation caused the GFC, but underlying the link between deregulation and EMH is a further step. Another clear relationship is the incompatibility between EMH and Behavioural Finance, but nobody ever pointed the clear connection between deregulation and BF. The final and logical conclusion of the thesis is that behavioural finance not only raised perplexity on the EMH's validity, it also categorically reject financial deregulation. The main, most accepted new finding of behavioural finance is the irrationality of individuals and markets (markets are in facts a multitude of individual brains), which completely excludes the efficiency of any deregulated free financial market, and recent history provides evidence

of it. The reason why deregulation is strongly auspicated by libertarians is that it grants more freedom and rights to individuals, and EMH explains why deregulation is not only ethic, it is also efficient. But once we dismiss the EMH, deregulation has no more theoretical foundation.

Bibliography

Ali, Paul, Ian Ramsay, Cate Read, «Behavioural Law and Economics: Regulatory Reform of Consumer Credit and Consumer Financial Services», *SSRN Electronic Journal*, novembre 2014. https://papers.ssrn.com/abstract=2524131.

ARROW, KENNETH J., «RISK PERCEPTION IN PSYCHOLOGY AND ECONOMICS», *Economic Inquiry*, vol. 20, fasc. 1, 1982, pp. 1–9.

Avgouleas, Emilios, «The Global Financial Crisis, Behavioural Finance and Financial Regulation: In Search of a New Orthodoxy», *Journal of Corporate Law Studies*, vol. 9, fasc. 1, aprile 2009, pp. 23–59.

Barberis, Nicholas, Richard Thaler, *A Survey of Behavioral Finance*, Cambridge, MA, settembre 19, 2002. http://www.nber.org/papers/w9222.pdf.

Beechey, Meredith, David Gruen, James Vickery, «The Predictions of the Efficient Market Hypothesis | RDP 2000-01: The Efficient Market Hypothesis: A Survey», *Research Discussion Papers*, fasc. December, dicembre 2000. https://www.rba.gov.au/publications/rdp/2000/2000-01/predictions-of-the-efficient-market-hypothesis.html.

Bekaert, Geert, Campbell R. Harvey, Christian Lundblad, «Does financial liberalization spur growth?», *Journal of Financial Economics*, vol. 77, fasc. 1, luglio 2005, pp. 3–55.

De BONDT, WERNER F. M., RICHARD THALER, «Does the Stock Market Overreact?», *The Journal of Finance*, vol. 40, fasc. 3, luglio 1985, pp. 793–805. http://doi.wiley.com/10.1111/j.1540-6261.1985.tb05004.x.

Bresser-Pere, Luiz Carlos, «The Global Financial Crisis and a New Capitalism?», *SSRN Electronic Journal*, gennaio 2012. https://papers.ssrn.com/abstract=1605180.

Congress, United States., *Depository Institutions Deregulation and Monetary Control Act of 1980*, marzo 31, 1980.

Congress, Us, *SECURITIES EXCHANGE ACT OF 1934 TITLE I-REGULATION OF SECURITIES EXCHANGES. Sec. 1. Short Title. Sec. 2. Necessity for Regulation As Provided in This Title. Sec. 3. Definitions and Application of Title. Sec. 3A. Swap Agreements*, 2012.

Crawford, Corinne, *The Repeal Of The Glass-Steagall Act And The Current Financial Crisis*, *Journal of Business & Economics Research*, vol. ix, 2011.

Crotty, James, *The Realism of Assumptions Does Matter: Why Keynes-Minsky Theory Must Replace Efficient Market Theory as the Guide to Financial Regulation Policy*, s.d. https://scholarworks.umass.edu/econ_workingpaper.

Davies, Paul L, *GOWER AND DAVIES' PRINCIPLES OF MODERN COMPANY LAW EIGHTH EDITION*, s.d.

Driscoll, John C., Steinar Holden, «Behavioral Economics and Macroeconomic Models», 2014.

Getter, Darryl E, *U.S. Implementation of the Basel Capital Regulatory Framework*, 2014. www.crs.gov.

Gilreath, Zachary S, *The Culprit of the Great Recession: A Detailed Explanation of Mortgage-Backed Securities, their Impact on the 2008 Financial Crisis, and the Legal Aftermath Recommended Citation*, *Journal of Business & Technology Law*, vol. xiii, 2018.

Goodfiend, Marx&, Robert G King, *FINANCIAL DEREGULATION, MONETARY POLICY, AND CENTRAL BANKING*, s.d.

Governance, The Harvard Law School Forum on Corporate, «Efficient Markets and the Law: Predictable Past and Uncertain Future», *https://corpgov.law.harvard.edu/*, ottobre 2012. https://corpgov.law.harvard.edu/2012/10/01/efficient-markets-and-the-law-predictable-past-and-uncertain-future/.

Grant, Wyn, Graham K. Wilson, *The Consequences of the Global Financial Crisis: The Rhetoric of Reform and Regulation*, *The Consequences of the Global Financial Crisis: The Rhetoric of Reform and Regulation*, Oxford University Press, 2012.

Hyde, Stuart, Keith Cuthbertson, Dirk Nitzsche, «Monetary Policy and Behavioral Finance», *SSRN Electronic Journal*, dicembre 2011.

Illiashenko, Pavlo, «Behavioral Finance: History and Foundations», *Visnyk of the National Bank of Ukraine*, fasc. 239, marzo 2017, pp. 28–54.

Jackson, William D., *Glass-Steagall Act: Commercial vs. Investment Banking*, Library of Congress. Congressional Research Service., giugno 29, 1987. https://digital.library.unt.edu/ark:/67531/metacrs9065/.

Jayaratne, J., P. E. Strahan, «The Finance-Growth Nexus: Evidence from Bank Branch Deregulation», *The Quarterly Journal of Economics*, vol. 111, fasc. 3, agosto 1996, pp. 639–670. https://academic.oup.com/qje/article-lookup/doi/10.2307/2946668.

Kahneman, Daniel, Amos Tversky, «Prospect theory: An analysis of decision under risk», *Experiments in Environmental Economics*, 1:143–172, vol. i, Taylor and Francis Inc., 2018.

Keynes, John Maynard, *The General Theory of Employment, Interest, and Money*, 1936.

KING, PETER, «Richard H. Thaler and Cass R. Sunstein (2008), Nudge: Improving Decisions about Health, Wealth and Happiness. London: Yale. £18, pp. 293, hbk.», *Journal of Social Policy*, vol. 38, fasc. 4, ottobre 2009, pp. 726–727. https://www.cambridge.org/core/journals/journal-of-social-policy/article/abs/richard-h-thaler-and-cass-r-sunstein-2008-nudge-improving-decisions-about-health-wealth-and-happiness-london-yale-18-pp-293-hbk/27D2BA672C5F01C1CB62C5DDADB3C0E1.

Kraakman, Reinier, John Armour, Paul Davies, Luca Enriques, Henry Hansmann, Gerard Hertig, Klaus Hopt, et al., *The Anatomy of Corporate Law*, *The Anatomy of Corporate Law*, Oxford University Press, 2017.

Malkiel, Burton G., «Passive Investment Strategies and Efficient Markets», *European Financial Management*, vol. 9, fasc. 1, marzo 2003, pp. 1–10. https://onlinelibrary.wiley.com/doi/full/10.1111/1468-036X.00205.

Mccoy, Patricia A, Elizabeth Renuart, *The Legal Infrastructure of Subprime and Nontraditional Home Mortgages*, 2008.

Melé, Domènec, César González Cantón, «The Homo Economicus Model», *Human Foundations of Management*, 9–29, Palgrave Macmillan UK, 2014.

Murdock, Charles W, *The Big Banks: Background, Deregulation, Financial Innovation, and 'Too Big to Fail, ' Part of the Banking and Finance Law Commons, and the Securities Law Commons*, s.d. http://lawecommons.luc.edu/facpubs.

Nagatsu, Michiru, «Behavioral Economics, History of», *International Encyclopedia of the Social & Behavioral Sciences*, 443–449, Elsevier, 2015. https://linkinghub.elsevier.com/retrieve/pii/B9780080970868030531.

Onofrio, Alexandra D ', Raoul Minetti, Pierluigi Murro, *CERBE Banking development, economic structure and income inequality Banking development, economic structure and income inequality*, 2016. https://sites.google.com/site/cerbelumsa/home.

Popov, Alexander, *Working Paper Series Evidence on finance and economic growth*, s.d.

Pressman, Steven, *Hyman Minsky and behavioral finance*, *Journal of Behavioral Economics for*

Policy, vol. ii, 2018.

Rapping, Leonard A., Lawrence B. Pulley, «Speculation, deregulation, and the interest rate», *American Economic Review*, American Economic Association, maggio 1, 1985.

Sherman, Matthew, *A Short History of Financial Deregulation in the United States*, 2009. www.cepr.net.

Shiller, Robert J., «From efficient markets theory to behavioral finance», *Journal of Economic Perspectives*, 17:83–104, vol. xvii, 2003.

Shleifer, Andrei, *Inefficient Markets*, *Inefficient Markets*, Oxford University Press, 2003.

Silvers, Damon, Heather Slavkin, *The Legacy of Deregulation and the Financial Crisis: Linkages Between Deregulation in Labor Markets, Housing Finance Markets, and the Broader Financial Markets Recommended Citation*, *Journal of Business & Technology Law*, vol. iv, 2009.

Simon, Herbert A., *Models of man: social and rational; mathematical essays on rational human behavior in society setting.*, New York, Wiley, 1957.

Simon, Herbert A, *A Behavioral Model of Rational Choice*, *Source: The Quarterly Journal of Economics*, vol. lxix, 1955.

States Congress, United, *Commodity Exchange Act*, giugno 15, 1936. http://fraser.stlouisfed.org/.

Statman, Meir, *The Second Generation BEHAVIORAL FINANCE*, 2019. www.cfainstitute.org.

Strahan, Philip E, *THE REAL EFFECTS OF U.S. BANKING DEREGULATION**, 2002.

Wilson, Graham K., Wyn Grant, «Introduction», *The Consequences of the Global Financial Crisis: The Rhetoric of Reform and Regulation*, Oxford University Press, settembre 20, 2012.

«(No Title)», s.d. https://sec.report/Form/Securities-Act-of-1933.pdf.

«(No Title)», s.d. https://www.bancaditalia.it/pubblicazioni/interventi-direttorio/int-dir-2017/Rossi_Behavioral_Finance_Revolution_06122017.pdf.

«(No Title)», s.d. https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2115.en.pdf.

«(PDF) Efficient Markets Hypothesis», s.d. https://www.researchgate.net/publication/228319211_Efficient_Markets_Hypothesis.

«(PDF) Financial industry deregulation in the 1980s», s.d.

https://www.researchgate.net/publication/23529559_Financial_industry_deregulation_in_the_1980s.

«12 U.S. Code § 3801 - Findings and purpose | U.S. Code | US Law | LII / Legal Information Institute», s.d. https://www.law.cornell.edu/uscode/text/12/3801.

«1985--A Year of Easy Money in Stock Market : Dow Surges to Its Best Annual Gain Since 1975 - Los Angeles Times», s.d. https://www.latimes.com/archives/la-xpm-1986-01-02-fi-23654-story.html.

«A Behavioral Approach to Financial Supervision, Regulation, and Central Banking by Ashraf Khan :: SSRN», s.d. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3236792.

«A Behavioral Finance Perspective of the 2008 Financial Crisis», s.d. https://www.linkedin.com/pulse/behavioral-finance-perspective-2008-financial-crisis-mayuresh-jaiswal.

«Bank for International Settlements», s.d. https://www.bis.org/.

«Behavioral Finance: Psychology, Decision-Making, and Markets | Request PDF», s.d. https://www.researchgate.net/publication/311573978_Behavioral_Finance_Psychology_Decision-Making_and_Markets.

«Depository Institutions Deregulation and Monetary Control Act of 1980 | Federal Reserve History», s.d. https://www.federalreservehistory.org/essays/monetary-control-act-of-1980.

«Federal Home Loan Bank Act | Federal Housing Finance Agency», s.d. https://www.fhfa.gov/Government/Pages/Federal-Home-Loan-Bank-Act.aspx.

«Federal Reserve Bank of New York Circulars, 1248. Banking Act of 1933 | FRASER | St. Louis Fed», s.d. https://fraser.stlouisfed.org/title/federal-reserve-bank-new-york-circulars-466/1248-banking-act-1933-15952.

«Garn-St Germain Depository Institutions Act of 1982 | Federal Reserve History», s.d. https://www.federalreservehistory.org/essays/garn-st-germain-act.

GRAMM-LEACH-BLILEY ACT, 2000.

«H.R.6267 - 97th Congress (1981-1982): Garn-St. Germain Depository Institutions Act of 1982 | Congress.gov | Library of Congress», s.d. https://www.congress.gov/bill/97th-congress/house-bill/6267.

HERBERT SIMON SOCIETY Behavioral finance revolution and the financial regulations and policies Opening Remarks Salvatore Rossi Senior Deputy Governor of the Bank of Italy and President of IVASS, s.d.

«How Congress set up the subprime mess - Jan. 31, 2008», s.d. https://web.archive.org/web/20090425222614/https://money.cnn.com/2008/01/30/real_estate/congress_subprime.fortune/.

«Keynes's 'beauty contest' | Financial Times», s.d. https://www.ft.com/content/6149527a-25b8-11e5-bd83-71cb60e8f08c.

«Marquette Nat. Bank v. First of Omaha Svc. Corp. :: 439 U.S. 299 (1978) :: Justia US Supreme Court Center», s.d. https://supreme.justia.com/cases/federal/us/439/299/.

«Neoclassical Economics, by E. Roy Weintraub: The Concise Encyclopedia of Economics | Library of Economics and Liberty», s.d. https://www.econlib.org/library/Enc1/NeoclassicalEconomics.html.

«The Indisputable Role of Credit Ratings Agencies in the 2008 Collapse, and Why Nothing Has Changed», s.d. https://truthout.org/articles/the-indisputable-role-of-credit-ratings-agencies-in-the-2008-collapse-and-why-nothing-has-changed/.

«The Prize in Economic Sciences 2017 - NobelPrize.org», s.d. https://www.nobelprize.org/prizes/economic-sciences/2017/summary/.

«The Uniform Small Loan Law», *Harvard Law Review*, vol. 42, fasc. 5, marzo 1929, p. 689.

«The Uniform Small Loan Law on JSTOR», s.d. https://www.jstor.org/stable/1330334?seq=1.

«TOPN: Federal Credit Union Act | US Law | LII / Legal Information Institute», s.d. https://www.law.cornell.edu/topn/federal_credit_union_act.