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Libor and Euribor

From normal banking practice to manipulation to the potential for reform

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Introduction: a brief history of reference rates

Libor and Euribor are the reference interest rates that set the average cost of loans among a restricted group of banks. The major relevance of Libor and Euribor relies, however, on their being metonymically associated to international interbank money markets in which banks engage in a series of mutual over-the-counter lending operations. These markets are only half a century old. They started to develop in Europe in the late 1950s and throughout the 1960s, giving rise to a London-based transactional structure known as the Eurodollar market, whose activities went uncontrolled by either national central banks or the Bretton Woods fixed exchange rate system institutions (Arrighi, [1994] 2010, p. 310). The quick expansion of such an informal market – which soon became a fundamental source of funding for large banks and multinational corporations (BIS, 1983, pp. 11–12) – sometimes gets interpreted as a reopening of the international financial circuits that had otherwise stayed shut since 1929 (see Ridley and Jones, 2012; Engelen *et al.*, 2010, p. 47). The breakdown of the Bretton Woods Accord in 1971 symbolized a new era of fluctuating rates, with banks and corporations increasingly recurring to financial derivatives so as to actively manage risk: interest rate swaps, forward rate agreements as well as currency options and swaps became associated with Eurodollar lending operations as from the late 1970s onwards (Kirti, 2014). In 1981, the calculation of the Libor rate was for the first time based on a daily poll arranged by the Chicago Mercantile Exchange, officially launched as an index of the same Eurodollar market in 1985 under the supervision of the British Bankers Association. At the same time, similar rates appeared in Europe, such as Pibor, Fibor or Aibor, which would later merge into Euribor. This later rate was introduced in 1999 under the administration of the European Banking Federation and soon became the leading benchmark for interbank lending operations within the Eurozone.

This brief historical sketch serves to properly situate the emergence and centrality of reference rates such as Libor and Euribor. Though credit is usually presented as the lifeblood of the economy, enabling the regular circulation of money among producers, distributors and consumers, or among employers, employees and a host of different business counterparts (cf. Tett, 2009, p. 28), the systemic importance of international interbank loans is a relatively recent event stemming from coalescent economic, political, organizational, technological and even theoretical

developments. One of such developments has to do with a long post-Second World War process of both liquidity and mass consumerism enhancement (Westbrook, 2010, pp. 30–1; Marron, 2009, pp. 79–98), first supported by the state during the heyday of Keynesianism and progressively assumed by private actors (namely banks via retail credit) under a neo-liberal deregulatory framework. This transition was paralleled and indeed further reinforced by the computerization and synchronization of financial markets (cf. Knorr Cetina and Bruegger, 2002), which deepened the internationalization of interbank borrowing supported by electronic transfer systems and enabled Eurodollar market access to smaller domestic banks. Finally, and though this may appear as a lateral process, conceptual developments in the area of finance – e.g. the famous Black–Scholes–Merton option pricing model (cf. MacKenzie, 2006) – liberated the expanding realm of derivatives from the negative connotations associated with gambling and speculation. Finance thus began to appear as a highly technical and measurable process, assisted by a host of theoretical constructs such as the efficient market hypothesis, random walk theory or the capital asset pricing model, giving a new breadth to the industry of indices and benchmarks.

This industry currently publishes over a million indices every day, whether exclusively concerning financial markets or markets with which finance closely interrelates, such as the energy, real estate and maritime transportation markets or even non-market realities such as global warming and longevity rates. Investment strategies, insurance and pension plans, savings accounts and retail loans are now commonly interlinked with the rise and fall in one or more of such indices. In this respect, the Libor story becomes quite illustrative. Throughout the 1970s, a reference interest rate with the same name began to get adopted by groups of banks to price Eurodollar adjustable rate lending operations known as syndicated loans: every three or six months, when the interest rates of these loans were about to be readjusted, the banks forming the syndicate communicated to each other their respective funding costs, whose averaged value would consist of the adjusted interest rate for the new period arising. The Libor rate in those days was, in many respects, a club instrument devised and employed by those most committed to using it (see Rauterberg and Verstein, 2013, p. 4), in a circular scheme that clearly suggests self-reference. This scheme was largely maintained when a centralized calculation of Libor based on a daily poll was put into practice by the Chicago Mercantile Exchange in 1981 (MacKenzie, 2009, p. 81) and, four years later, officially assumed by the British Bankers Association, with rate production continuing to derive from quotes provided by Libor's biggest users. By the mid-1980s, however, the relevance of Libor had already gone far beyond syndicated loans to encompass both the derivatives and the retail credit markets. The rate had become what Ashton and Christophers (2015, pp. 190–1) call a 'legal technology of arbitration', serving as an external referent enabling the creation of a multiplicity of new contractual relationships. In the words of Minos Zombanakis, an old Greek banker who took part in those pre-1981 Libor indexed syndicated loans (cited in Ridley and Jones, 2012): 'We started something which was practical and convenient. We never had in mind that this rate would spread to mortgages and things like that. . .'

Astonishment is, of course, a frequent after-the-fact reaction to financial turmoil and scandal, and one that may divert attention from processes of strategic recombination and exponential imitation that actually make up the contemporary financial world. This chapter intends to follow the road that leads from convenient practice to contagious expansion to manipulation and, finally, to a promise of reform. In this respect, three things deserve properly underlining. The first is how the Libor rate was nurtured by influential players strategically positioned at the convergence points of international finance and thus endowed with a capacity to set new rules and thereby extend a game they were already playing. The second stems from a tendency towards continuing to do things along previously stipulated lines, following what sociologist

Niklas Luhmann ([1997] 2012, p. 41) describes as operationally closed organizational practices – and we will see that manipulation attempts fit this picture more as a rule than as an exception. The third factor embodies a cluster of nexuses or associations that expands while – indeed also because – old habits remain. Thus, when Euribor came to being in 1999 and replaced former interbank rates in francs, marks and other currencies, it soon became clear that it would no longer indicate a single, circumscribed reality – the average interest rate practised in lending operations among a restricted group of banks. As with Libor at that time, Euribor was supposed to signal a wider interbank money market and even the whole economy (to the extent this gets perceived in accordance with the conditions imposed on the international interbank lending funded retail credit supply). In this sense, both Libor and Euribor may also be viewed as multi-referential and multifunctional rates with a notable aggregation capacity.

That, in a nutshell, constitutes the main argument of this chapter. The trail of both Libor and Euribor is here followed in relation to an organizational complex combining specific material infrastructures, legal arrangements, communication channels, representational devices and workplace routines (while impossible to describe in detail all the facets composing this complex and across various countries, some concrete examples are provided). The chapter proceeds as follows. The next section presents Libor and Euribor in their contemporary, multi-referential guise. The third section offers some ethnographic evidence of how these rates are employed in routine banking practices, highlighting their somewhat diverse usages and implications (i.e. their multifunctionality). The fourth section introduces the Libor/Euribor manipulation scandal, which became a public issue in the spring of 2012. The fifth section describes some of the efforts taken towards the reform of both rates. The sixth section puts forward the conclusions reached. The research underlying this chapter was mainly supported by two post-doctoral grants awarded by the Portuguese Foundation for Science and Technology (FCT): SFRH/BPD/37785/2007 and SFRH/BPD/78438/2011. Additional funding was provided by the FCT's strategic project for research units (PEst-OE/SADG/UID428/2013) and a FAPESP grant for visiting scientist (Process No. 2014/04977-1).

Libor and Euribor as multi-referential benchmarks

As stated, Libor (the London Interbank Offered Rate) and Euribor (the Euro Interbank Offered Rate) indicate the average interest rates practised in unsecured lending operations among a selected group of banks, termed 'panel banks'. Libor refers to transactions occurring in the London interbank money market through different real-time gross settlement systems (RTGS). At present, this rate contemplates five different currencies: pound sterling, euro, yen, Swiss franc and, most notably, the US dollar – whose rates usually correspond to the meaning of the word 'Libor' in the absence of any further specification. Euribor refers to transactions in the Eurozone money market made through the Trans-European Automated Real-Time Gross Settlement Express Transfer System (TARGET2) controlled by the Eurosystem. Contrary to Libor, Euribor is focused exclusively on the euro currency. The calculation processes of the two rates bear many similarities being based not on actual interest values but rather on individual estimates regularly submitted by panel banks to an external calculation agent – Thomson Reuters/Intercontinental Exchange (ICE) for Libor and Global Rate Set Systems Ltd for Euribor. These calculation agents collect the information received and perform the computation on behalf of the entities currently responsible for administering each rate. On 3 February 2014, the Libor administration was transferred from the British Bankers Association to ICE Benchmark Administration Ltd (a private network of exchanges and clearing houses), while Euribor is presently managed by the European Money Markets Institute, previously known as

Euribor-EBF, a nonprofit international association founded in 1999 and under the auspices of the European Banking Federation.

The information available on Libor and Euribor computation processes does not yet contemplate these recent replacements at the calculation and administration levels even while the overall delegation structure remains the same. Basically, the calculation takes about an hour and a half to complete and combines both automated and manual input procedures (cf. EEMI, 2014; EBA and ESMA, 2013, pp. 10–11; MacKenzie, 2009: 81–2). Every business day at around 10:00 (Greenwich Meridian Time in the case of Libor, Central European Time in the case of Euribor), Thomson Reuters and Global Rate Set Systems clean all information regarding previous data and open up their systems so that each panel bank can electronically submit the newest estimates via private pages accessible only to the calculation agents and the bank in question – the submissions including lending offers of no stipulated amount for a group of maturities ranging from overnight (Libor only) to 12 months – see Table 12.1. The system remains open for about an hour before there follows a smaller period during which panel banks can revise and correct the information provided or be notified by the calculation agent in case of communication failure or any other such anomaly. Then the window closes and the rate calculation begins: for each maturity, a percentage of the highest and lowest quotes (25 per cent in the case of Libor, 15 per cent in the case of Euribor) is automatically eliminated, with the remaining rates averaged and rounded off to five (Libor) or three (Euribor) decimal places. Around 11:30, the calculation agent will publish the newest rate values, which become accessible to subscribers and can subsequently be further disseminated (Figure 12.1).

The further dissemination of the Libor and Euribor rate reflects both their relevance and the current structural significance of these two benchmarks. As mentioned in the introductory section, both Libor and Euribor are now widely employed as reference rates in multiple over-the-counter and exchange-traded derivatives contracts such as interest rate futures, options and swaps or forward rate agreements, while at the retail level the two rates also integrate into a variety of products, from corporate loans to mortgages to student loans to credit cards (Ojo, 2014; Kiff, 2012). In this vein, the US dollar Libor acquired the reputation of being the most important series of numbers in the whole world (*Money Week*, 2008), with Euribor taking on an equally prominent status though in a less ample market context. Hence do we here refer to both Libor and Euribor as multi-referential and aggregative rates. Though originating in an elite circuit of interbank lending, the two rates have clearly escaped that primary context to become involved in the calculative and legal arrangements of other financial markets. Indeed, the usage

Table 12.1 Excel spreadsheet used for internally informing of the Euribor rate values in one Portuguese retail bank

	LAST	*LAST 1*	*LAST 2*	*LAST 3*
SW	4,405	4,405	4,386	4,388
1M	4,484	4,484	4,485	4,484
2M	4,757	4,756	4,757	4,757
3M	4,964	4,963	4,964	4,963
(. . .)	(. . .)	(. . .)	(. . .)	(. . .)
1Y	5,321	5,306	5,314	5,301
	22-08-2008	21-08-2008	20-08-2008	19-08-2008

Notes: English in the original: reading from left to right, the first column indicates the maturities, with 'SW' standing for Spot Week; the second column (titled 'LAST') displays the newest Euribor values, with the following columns presenting the values of the three previous days, for the purposes of comparison (the corresponding dates appear below).

	LIBOR					EURIBOR
Market context	London Interbank Money Market					Eurozone Interbank Money Market
Administration	ICE Benchmark Administration Ltd					European Money Markets Institute
Currencies	USD	GBP	EUR	JPY	CHF	EUR
Number of panel banks	18	16	15	13	11	24
Tenures	Overnight, 1 week, 1–3 months, 6 months, 12 months					1–2 weeks, 1–3 months, 6 months, 9 months, 12 months
Calculation agent	Thomson Reuters/Intercontinental Exchange (ICE)					Global Rate Set Systems Ltd
Dissemination of results	Real time for subscribers and with a 24 hour delay for the public in general					

Figure 12.1 Generic information about Libor and Euribor, December 2015

of such reference rates in retail credit contracts is now usually reinforced by national jurisdictions, sometimes with concrete specifications regarding employable tenures or averaging procedures as in Spain, Portugal or Italy (I return later to this point), while in countries such as Belgium, the use of Libor and Euribor as reference rates for retail credit is strictly forbidden – with all mortgages indexed to Belgian sovereign bonds instead (see Zachary, 2009).

Libor and Euribor in normal banking practice

The closest example to an ethnography of Libor calculation may be found in MacKenzie (2009, pp. 1–2). In this section, I propose to complement his impressions by putting forward a picture of how Euribor rate numbers are processed outside panel banks and at the level of normal banking practice. Until recently, public dissemination of both the Libor and Euribor values was made in real time and shortly after the calculation agent had published the newest rate values. In 2014, both administrators introduced a 24-hour delay. The following empirical description refers to a period before this alteration was implemented, though the cognitive, interactive and

bureaucratic procedures remain valid today. The action takes place inside the financial department of one Portuguese retail bank. In the dealings room of this financial department, there was a person in charge of the interbank money market operations. This same person was also responsible for informing the bank's marketing and commercial branches of the newest Euribor values. Thus, every day, around 11:30 CET (10:30 in Portugal), she accessed the calculation agent's page on one of her computer screens from which she copied the latest Euribor values and pasted them into a previously prepared Excel spreadsheet as shown in Table 12.1.

The Excel file was then renamed and immediately sent to other banking departments. One can thus observe how, at a very immediate level, reference rates enter the realm of organizational practice also as expedients that maintain specific communication channels (both internal and external) open and active.

What gets communicated through these channels subsequently serves as the basis for further action. The fact that both Libor and Euribor are now incorporated into many retail credit products with adjustable interest rates means that the two indices have transcended the boundaries of what they supposedly indexed (the interbank money market) to begin performing new functions – in this case, employed as base rates in retail credit products – in other financial market segments. A link between wholesale and retail finance thus becomes established. For this purpose, the official rate values require some further adjustment. In terms of calculation, the Euribor rate used in Portuguese retail credits is subject to another new round of averaging. The values regularly provided by the calculation agent and internally released through documents such as in Table 12.2, thus undergo compilation at the end of each month and then divided by the corresponding number of days, the resulting simple mean consisting of the more mundane Euribor indexer – or base rate – used in retail credit and which would have to be incorporated into retail contracts coming into effect the month thereafter (note the lag effect that also accompanies the transition from wholesale to retail finance). The rules of this calculation have been declared mandatory by a specific Portuguese law (*Decreto-lei 240/2006*), which added that banks were only permitted to round up the rate's fourth decimal place. At this point, the Euribor rate ceases to be the trimmed average of projections regarding lending prices in the interbank money market to become an actual interest rate component, applied uniformly to retail credit contracts along with a spread depending on individual risk scores.

Because of this multifunctionality, both Euribor and Libor are now omnipresent in regular banking practice. Updated Libor/Euribor values must be regularly incorporated into online credit simulators, a procedure far from automatic – usually implying a series of trial and error operations and, in most cases, mobilizing human resources from different banking departments. Current Libor/Euribor values may also be present in calculations associated with product developments, especially regarding the choice of tenures in relation to specific credit modalities. Moreover, banks are frequently prompted by the media and consumer or industry associations to provide information regarding their supply with this usually involving similar comparisons between different rate maturities. In addition, Libor/Euribor play an important role in reports depicting business evolution or in budgetary activities (where future profits are anticipated according to a projection of future rate values). As such, documents and graphs describing the history of Libor or Euribor along with the tables displaying the newest values provided by their calculation agents emerge as relevant sources of information for marketers, risk analysts and other banking professionals working at the commercial branches (one fieldwork recollection regards a dossier titled 'Home Loans/Interest Rates 2008' where one marketer could readily pick up Euribor values relative to any previous month).

Most of these cases incorporate a pragmatic view of Libor/Euribor, that is, a perspective in which the information provided by the calculation agent and subsequently recalculated for retail

Table 12.2 List of the main public consultations on financial benchmarks, in chronological order

Consultation paper	*Leading institution*	*Dates*	*Number of published responses*	
			Institutional	*Personal*
Functioning and Oversight of Oil Price Reporting Agencies	IOSCO	2012-03-01/2012-03-30	15	3
The Wheatley Review of Libor: Initial Discussion Paper	Financial Services Authority (UK)	2012-08-10/2012-09-07	Over 60 (unpublished by the FSA)	
Consultation on Market Manipulation: Lessons and Reform post-Libor/Euribor	European Parliament/ Economic and Monetary Affairs Committee	2012-08-20/2012-09-17	43	2
Consultation on the Regulation of Indices	European Commission	2012-09-15/2012-11-29	75	—
The Regulation and Supervision of Benchmarks	Financial Services Authority (UK)	2012-12-05/2013-01-16 and 2013-02-13	24	—
Financial Benchmarks Consultation Report	IOSCO	2013-01-11/2013-02-11	55	2
Principles for Benchmarks-Setting Processes in the EU	EBA and ESMA	2013-01-11/2013-02-15	67	—
Principles for Financial Benchmarks Consultation Report	IOSCO	2013-04-16/2013-05-16	42	1

purposes is mostly taken for granted, with actors merely accounting for acute number reproduction from reliable sources – often a chart like Table 12.2, prepared for dissemination by entitled professionals within each bank – to new documents, files and calculation instruments. What counts as Libor or Euribor is the list of percentages reputedly stemming from such reliable sources, distributed along a network that starts in the calculation agent's online page and may end in several retail credit simulators available on bank web pages and local branches – with one stop for reproduction in the bank's financial department and another in the marketing department in the case of the two Portuguese banks where I did my fieldwork. Since there was only one desktop and screen per desk in the marketing areas of both banks, a common strategy was to print out the source of Euribor values so as to better verify that the same values had been correctly inserted into newer reports, tables and devices. During credit simulator rates updating, for example, marketers in charge of this task would make recourse to a printed table exhibiting the newest Euribor indexer values while testing the simulator prototype available on screen to ensure that no mistakes had been made. In such cases, Euribor percentages were compared to each other, either confirming that there was a perfect match or evaluating the rate's movements over a specific period, and with absolutely no concern for questions such as whether those percentages adequately reflected the current interbank lending conditions or whether there was any substantial difference between the Euribor rate published by Thomson Reuters and the nationally prescribed calculation of the Euribor indexer (I am here simply making an ethnographic

statement, and not implying that retail banking actors *should* have this kind of concern around Euribor descriptions and representative capabilities).

It is thus possible to speak of a routine principle of reproduction in which bankers keep in line with past organizational practices. This principle both relates with operational imperatives and remains necessarily closed to marginal interrogations. Libor and Euribor, as taken-for-granted facts, are thus mandatorily copied from one station to another, from one document to another, with actors more concerned with accurate 'reproduction' than with the supposed 'accuracy' of that being reproduced.

There is, however, more to the story. Not only are both Libor and Euribor laterally involved in a multitude of financial instruments and investment strategies but they also act as trading targets. Betting on trends in Libor or Euribor now represents common practice even while the classification of such a move as an 'investment' has equally involved specific legal arrangements in the respective different jurisdictions (see MacKenzie, 2009, pp. 75–8). Such trading strategies are usually developed within global megabanks acting as brokers and subsequently handed down with a delay to smaller players under a contracted business relationship (see Box 12.1 for an example).

[Name of broker]

Euribor: cheap upside printing, possible protection against EBC aggressive rate policy shift – Paper bot 10K ER 95 25 / 95 50 1 x 2 with Libor remaining at current levels (7 bps above repo fin rate), trade targets almost 50bps of easing by yr end. . .

Box 12.1

Long call ladder option strategy sent from a then Euribor/Libor panel bank via a Bloomberg chat room to a Portuguese retail bank. The strategy bets on a Euribor rate cut of 50 basis points – note how the projection also takes the Libor values into consideration (English in the original).

Source: Author's fieldnotes.

Trader reactions to such 'broker tips' are far from mechanical not only due to the cryptic jargon but also because additional information is usually required: special, subscribed website pages run by important news providers such as Bloomberg or Reuters may thus be accessed to view graphs with Libor/Euribor predictions plus information regarding the instrument or strategy under analysis, such as its profit and loss curve or the latest transaction prices. The capacities of smaller banks to invest must also be taken into consideration as many strategies will only pay off when the bank enters the market with a number of contracts larger than those internally affordable to its own trading portfolio. In these cases, banking actors are no longer merely copying information from one platform to another but rather prospecting information and gathering knowledge in order to reach an investment decision. The knowledge itself is, however, equally based on standardized market indices and devices, with traders seldom questioning the adequacy

of the information coming from the news providers. Libor and Euribor thus remain unquestioned presuppositions under which new questions may be asked, regarding not the interbank money market itself but, for example, the options and futures markets, whose fluctuations are comparably faster.

In sum, whereas marketers oscillate between the reproduction of Libor/Euribor daily and monthly rates, traders ignore both to concentrate mainly on the real time evolution of Libor/Euribor derivatives markets as displayed on trading terminals, waiting for the right moment to step in or step out. In all cases, Libor and Euribor are taken as established *facts* – i.e. something largely taken-for-granted and thus serving as an unproblematic basis for further activities (see MacKenzie, 2009, pp. 9–10) – with careful reproduction specifically intended to preserve their facticity.

Manipulation scenarios

The so-called Libor manipulation scandal erupted in June 2012 out of a sequence of investigations by the former UK Financial Services Authority. Controversy around Libor does, however, hold a longer history. MacKenzie (2009, p. 82) situates the emergence of this controversy in 2007–08, in close association with the bailouts of UK banks Northern Rock and Bear Sterns. MacKenzie's account, though, still highlights Libor's facticity. The rate is thus presented as 'an example of a measure that *has* usually been taken as an adequate representation of the underlying market' (ibid., p. 79, emphasis in the original), and whose 'fixing is designed to be *sociologically* robust, so to speak' (ibid., p. 82, again, emphasis in the original). Suspicions around possibly deflated Libor values in the midst of the 2008 financial turmoil were communicated by the panel banks themselves to the British Bankers Association and the Bank of England (Mollenkamp, 2008). In 2009, the UK Financial Services Authority undertook a systematic investigation of the institutions involved in the Libor submission process, with cooperation from regulators and public authorities in other jurisdictions whose currencies then integrated the list of Libor rates – namely the United States, Japan, Switzerland, the European Union and Canada (which would later withdraw its currency from the Libor list) (cf. *The Wheatley Review of Libor: Final Report*, 2012). This investigation found evidence of regular rate rigging inside certain panel banks from at least 2005 onwards thus confirming what previous accounts based on econometric screening models designed to detect signs of possible conspiracy and manipulation had hesitantly hinted at (cf. Abrantes-Metz *et al.*, 2008). However, some media sources have subsequently reported statements from traders dating obscure practices as of the late 1980s (*The Economist*, 2012) – thus encompassing almost all of Libor's official history.

Rate rigging means the submission of Libor values inflated or deflated according to the bank's investments in derivatives or loan portfolios. The extent of US bank and Euribor/Libor panel member Citigroup's swap operations in early 2009, for example, was susceptible to providing significant returns should the Libor value drop (Snider and Youle, 2010). Profits deriving from bank retail credit portfolios might also prove substantial in case of deliberate rate increase as this would correspondingly increase the monthly instalments of millions of borrowers with Libor indexed loans – hence the lawsuits filed by US homeowners against a number of panel banks accused of strategically inflating Libor submissions at the beginning of each month just when most adjustable rate mortgages got reset (see Touryalai, 2012). This type of manipulation is usually described as 'positional' (Rauterberg and Verstein, 2013, pp. 31–2) or 'portfolio driven' (Snider and Youle, 2012) and requires some form of coalition between the employees submitting rate information, traders and even senior administrative staff all of whom are working for the same bank (see *The Economist*, 2012; Snider and Youle, 2012, pp. 8–9). Barclays Bank – that took

centre stage during the scandal and was fined for manipulation attempts – also admitted the existence of tacit agreements among certain panel members to foster portfolio driven rate rigging. Collusion has indeed been at the heart of the whole Libor scandal, as testified to by another lawsuit lodged by the US Federal Deposit Insurance Corp against panel members (Raymond and Viswanatha, 2014).

A second type of rate manipulation has already been alluded to: the submission of rate values lower than those actually obtained so as to safeguard the bank's creditworthiness in times of lower liquidity levels. Such a strategy was intentionally deployed during the 2008 financial freefall and with every likelihood of having required the acknowledgement and approval of senior staff. There is, thus, some variety in the procedures to that which constitutes rate manipulation and the coalitions that need establishing in order to bring this about. Enough evidence has been provided of manipulation attempts involving horizontal *internal* collaboration between traders and staff members in charge of submitting rate values. No one seems to doubt that vertical internal collaboration, forming a triangle with the upper edge occupied by senior directors, also occurred. Finally, allegations of collusion point clearly towards both horizontal and vertical *external* collaborations, i.e. taking place across different panel banks. Of course, from a sociological point of view, horizontal/vertical and internal/external emerge as situational coordinates revealing the highly composite and flexible character of contemporary global banks. In fact, such global banks seem closer to being clusters of independent operational networks rather than uniform organizations – and it is perhaps important to stress that these same panel banks were among the first to report possible attempts at manipulation with the settlement of the whole Libor affair having largely benefited from the cooperation of bank employees acting against some of their colleagues and directors.

All this brings us back to the issue of self-reference. Let us recall that the official Libor rate was calculated on the basis of information submitted by Libor's most important users and on behalf of a bankers association. In a way, Libor never ceased to be the 'club good' that the pre-1981 Eurodollar community tailored for its own practical purposes. Evidence gathered by authorities and journalists suggests that false reporting has all along featured as part of Libor's official history – to a greater or lesser extent similar to the investment activities described in the previous section – and not just as a consequence of market turbulence or liquidity problems at particular times. In this sense, we may approach Libor manipulation as an example of financial innovation performed by well positioned and well adapted elite intermediaries acting as *bricoleurs* (cf. Engelen *et al.*, 2010, pp. 53 and 56). Indeed, while Ashton and Christophers (2015, p. 197) view rate rigging as a variety of arbitrage, we take it here as an example of financial bricolage or innovation in its crudest sense, since – as the same authors acknowledge (ibid., p. 198) – rate rigging meant the creation, and not just the discovery, of new price differentials through specific arrangements only accessible to certain panel bank employees.

On this basis, two things deserve highlighting. The first is that such an innovation soon became routine: apparently some traders needed but a Mars bar to persuade their cash desk colleagues to indulge in such a scheme, as told by a former UBS and Citigroup trader (see Marston, 2015). The second is that the same principle of strategic invention remains valid even when moving from the globally to the nationally circumscribed circuits of financial convergence. We have already described how Euribor rates were subjected to a second round of averaging before their application to mortgages in countries such as Portugal. In this respect, Portuguese banks have already also faced allegations from citizens and consumer associations of discretionarily averaging the Euribor mortgage indexer through both the rounding up of the fourth decimal case and the use of a 365-day basis for annual credit interest calculation while annual deposit interest was estimated solely on a 360-day basis (the idea, in this latter case, obviously

incorporates that of increasing the amount of interest receivable to the detriment of that payable). These practices, which were subsequently regulated by a series of bills (see Lopes, 2013, p. 22, note 6), clearly reveal how Portuguese banks were also creatively deploying their capacity to play with basis points and incorporating this into their routine practices.

Reaction and reform

Rigging suspicions soon extended from Libor to Euribor and other interbank rates (cf. European Commission, 2012, p. 2), leading both to the inclusion of financial indices manipulation in the 2012 revision of EU Market Abuse Directive and to extensive reviews of financial and market benchmarks led by international political organizations such as the European Commission and the European Parliament, and international supervisory authorities such as the International Organization of Securities Commissions (IOSCO, founded in 1983), the European Banking Authority (EBA, established in 2011) and the European Securities and Markets Authority (ESMA, also established in 2011) (see Table 12.2 for a list of the public consultations around this issue). The Board of Governors Economic Consultative Committee of the Bank for International Settlements contributed to the debate with a report entitled 'Towards Better Reference Rate Practices: A Central Bank Perspective' (March 2013). All these regulatory work streams were paralleled by efforts towards establishing new benchmark principles and codes of conduct, and as developed by industry associations such as the Global Financial Markets Association, the Index Industry Association, ASSIOM Forex (the Financial Markets Association of Italy), or by private index providers acting in cooperation such as Argus, Platts and ICIS.

The participants in these discussions were mostly institutional: alongside industry associations there were national and international regulators, banks, brokers and asset management firms, stock exchanges and other index providers, and, to a lesser extent, consumer associations. Furthermore, a considerable number of these institutions participated in more than one public consultation (often recycling their responses to previous consultations given the juxtaposition of content). Such is the case of the main index providers and industry associations whose collaboration with the authorities also included attending private meetings. Notwithstanding the global scope of the subject under consultation and the leading institutions' receptivity to contributions from anywhere, the geography of respondents inevitably reflected global asymmetries, with the United States and the main European Union countries (the UK, Germany and France) massively represented, along with other rarer contributions from South Africa, Australia (both only in the IOSCO consultations) and Japan, with the total absence of Russia, China, India, South America and other African countries.

Within these debates, issues around facticity and representational accuracy were paramount to regulators. According to the European Commission consultation paper (2012, p. 2), benchmarks are thought to rigorously reflect the economic realities that they intend to measure – hence the allusion to transaction based evidence as the ultimate constituent of market reality. Or, as ESMA executive director Verena Ross stated during one public hearing held in Paris (13 February 2013), with Libor and Euribor in mind, 'there must be some reality check between what the benchmarks say and what transactions say'. Libor and Euribor represent, in this respect, an interesting case, in that the interbank market they were supposed to reflect largely ceased to exist in the wake of 2007–08, at least for maturities of over one month as duly noted by many respondents to these consultations and acknowledged by the authorities themselves. This was attributed to a series of interrelated causes, ranging from the European sovereign debt crisis and rating downgrade to the growing influence of central bank lending facilities to Basel III new liquidity

coverage ratio measures to – last but not least – the Libor scandal itself. In the words of former US Commodity Futures Trading Commission Chairman Gary Gensler, during an IOSCO public roundtable held in Washington also in February 2013 (YouTube, 2013), 'this is a world in which banks are being asked to quote something that might not even exist'. Indeed, with reference to the over thirty day Libor and Euribor rates, 'if the benchmark isn't benchmarking something, then what is it that we have here?'

We have a fiction, perhaps a 'convenient fiction', as one *New York Times* journalist once put it (Norris, 2012), echoing concerns first expressed by bankers (see Tett, 2007); but we clearly do not have a fact. Furthermore, as both regulators and actors, as well as sociologists of finance, maintain, trust in financial markets stems from facts and not from fictions. A reliable 'fact', in this case, means a number seen as adequately reflecting market reality, preferably anchored in actual, observable transactional data and susceptible to being incorporated into normal bureaucratic practices without any further concerns. One of the main conclusions of these rounds of public consultations regards the supremacy of prices as practised in authentic deals over price estimates as the basis for index production. Some participants – namely stock exchanges and related venues – even advanced rather Manichean distinctions between 'objective' and 'subjective' benchmarks or 'neutral' and 'panel based' index providers (EUREX, 2013; STOXX, 2012). From a sociological perspective, however, the production of facticity depends on a set of arbitrary conventions and discretionary judgements sustained by a community of fact users who also oversee fact production. The several original Libors applied to syndicated loans shared this characteristic. Commenting on a specific Scott Paper Company contract involving the production of a Libor rate by a small group of banks under the eye of a larger banking committee, Gary Gensler noted approvingly in the same IOSCO public roundtable that 'it's like living in a small town, or in a small village: it's less prone to misconduct because the community keeps you in line' (YouTube, 2013).

Even liquidity, so often regarded as the ultimate source of price objectivity, may be understood as a consequence rather than the cause of index creation, as indeed stressed by some respondents to these public consultations who explained that, by providing standardized, easily accessible information about a certain market sector or commodity, a new index may increase the visibility of such a sector or commodity, ending up stimulating further negotiation (see AFG, 2013, p. 3; ICE, 2013, p. 4). This means that benchmarks, in addition to being multi-referential and multifunctional, also prove performative, and this both in the positive sense – when a market develops in their image – and in the negative sense – when the represented market ceases to exist (see MacKenzie, 2006, pp. 16–20, for a discussion of the different performativity modalities). However, such a tension between facticity and what may be called fictionality emerges only episodically in these various discussions around index production, with regulators insisting upon the relevance of actual transactions (or, alternatively, of quotes committed to actual transactions) and internal governance mechanisms to ensure accurate reporting.

In the end, some minor changes were introduced into the production of Libor and Euribor – although the reform process is not yet complete. Apart from the already mentioned replacements at the administration and calculation levels, the number of tenures was considerably reduced (from 16 to 7 in the case of Libor and 15 to 8 in the case of Euribor) and a 24-hour delay of rate public release was introduced. A significant exodus of Euribor panel members (from 44 to 24) also deserves mention, especially because it forced regulators to intervene by declaring Libor and Euribor panel membership mandatory – a move that may indicate the club days are now over. Finally, efforts towards the development of parallel interbank rates drawing more substantially on actual transaction data are currently underway: private company STOXX has launched two rival benchmarks in 2013 while both the Federal Reserve and the European Money Markets

Institute are still working on viable substitutes to, respectively, Libor and Euribor. In this respect, the G20 has requested the launching of an alternative to Libor by 2016.

Conclusion

Notwithstanding the historical resilience of certain accounting standards and the irreversible character of computer technology, there is much about global finance and credit that appears precarious and fragile (cf. Carruthers and Ariovich, 2010, p. 3). The recent Libor/Euribor affair is but an episode of a turbulent saga of devaluations and miscalculations that intensified after the 2008 financial meltdown and brought forth the issue of financial reform as a more or less permanent necessity (see Lanchester, 2013 for a review of recent banking scandals). In such circumstances, it is obviously difficult to come up with straightforward answers and clear-cut solutions. In any case, the perspective outlined in this chapter suggests that other issues should be taken into consideration alongside facticity enhancement through recourse to transaction-based evidence and internal governance mechanisms. The history of Libor configures a movement from convenient practicality to contagious expansion that favoured innovative manipulation attempts and ended up in mandatory reproduction to avoid panel exodus and any immediate index discontinuation. Contrary to what some might think, such a movement is far from surprising, this chapter having proposed a few arguments that clearly help in illuminating why this is so.

First, the Libor rate was invented by elite international banks acting in a highly deregulated market (the London Eurodollar market) and committed to finding a solution for handling long-term interest rate risk. These actors were in very favourable position to setting the rules of the game: they gathered privileged data from among themselves and developed a new calculation. Thus, in a sense, they were innovators (or *bricoleurs*). However, what passes for innovation is quickly followed by imitation, and even more so in the case of finance. Most financial activity is indeed composed of repetitive goal-directed routines – to borrow an expression from sociologist Anselm Strauss (1993, p. 195). Even inside dealing rooms and other similar hot spots there are lots of things that still tend to be done according to previous lines of procedure – patterning and standardization enabling time economization and more efficient problem solving. As such, the same Libor rate began being used repeatedly for interbank borrowing, and later indexed to other products and starting to perform new functions. This aggregation capacity is mainly explained by the rate's multi-referential and multifunctional potential, which stems from a conjugation of factors: the extant connections between interbank lending and other financial markets, the absence of any patent registration restricting further Libor uses or the emergence of similar rates (such as the antecessors to the Euribor) and the fact that these rates consist of a list of numbers easily copiable from one station to another (as seen in section three a propos Euribor).

Libor's exponential success as a benchmark for the international interbank money market and beyond opened up new possibilities for the former club members then converted into panel banks. What is now recognized as manipulation is but a calculation prerogative of these players which shares many similarities with other forms of financial innovation. One may counter that Libor manipulation was not openly assumed by those practising it, and that these people surely knew that they were themselves cheating and could eventually be caught. The boundaries between right and wrong are, however, not as clear-cut as one might think. There are other financial innovations which appear wrapped up in a veneer of technical expertise before getting described as pure scam in many after-the-fact stories such as the Madoff case. Alternatively, to give a slightly different example, consider the subsequent rounds of calculation and averaging involved in Euribor adaptation to retail loans or deposits: in this case, the new calculations

performed opened up the possibility of gaming with rounding off and year extension in a way that forced national regulators to intervene and legislate – though banks were merely capitalizing on a legal void rather than actively manipulating the results. Innovation, just like manipulation, is mainly the result of an advantageous position that subsequently becomes amplified by repetition.

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