The Best of Both Worlds:

Scale Economies and Discriminatory Policies in London's Global Financial Centre

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Abstract:

From the early 1960s onwards London has managed to vie with New York for the top spot as an international financial centre. Ever since then, London has reigned as a leading global financial hub, despite not having behind it anything like the political or economic backing enjoyed by New York. This paper seeks to explain this phenomenon by building on Kindleberger's classic analysis of financial centres as international hubs that arise due to economic, geographic and infrastructural advantages, and more recent theories of specialised financial centres that suggest that financial centres deploy discriminatory business practices in order to compete with the scale economy-based centres. Our central claim here is that London's continuing financial supremacy can be traced to the way that the opposing 'economic' and 'political' sets of criteria necessary for a financial centre are here inextricably fused together in a mutually reinforcing dynamic. Three case studies are used to support this claim.

Key words: City of London; bank lending, capital markets, foreign exchange, OTC derivatives, liquidity, collateral, asset management, offshore financial centre.

Introduction

Historically, the financial centre of London evolved as a typical Marshallian district serving the sprawling British Empire (Davis & Huttenback, 1986; Kynaston, 2011). As the British Empire and the British economy's status as a major industrial power declined during the course of the 20th century, it was only to be expected that there would be a corresponding decline in the City of London's position as a leading international financial centre (IFC). This expectation was indeed temporarily met in the periods immediately preceding and succeeding WWII when the US emerged as the capitalist world's economic superpower and New York took over London's mantle as the world's foremost financial centre. However, from the early 1960s onwards London has managed to vie with New York for the top financial spot, despite not being endowed with political, diplomatic or economic backing supports enjoyed by the latter. In fact, as Z/yen, a commercial think-tank closely associated with the corporation of London, notes in a recent report, 'London has moved ahead of New York to reclaim the number one position' (Yeandle 2015: 4).

What lies behind this sustained premiership? Is it the collective effort of the City of London financiers, keen to preserve their power and status? The efforts of the British state? Or perhaps a unique combination of historical and geographical circumstances? The literature on financial centres offers two contrasting theories. One theory points to a combination of factors that span socio-economic, political, legal and geographical factors. In this interpretation, spurred by the deregulatory reforms of the 1986 'Big Bang', London was able to cash in on its stable political and business environment, reliable regulatory framework, English common law, and favourable geographical position including a central time zone and concentration of human talent (Yeandle, 2015; Yeandle, et al., 2005).

An alternative theory suggests, in contrast, that London is the world's premier 'onshore- offshore' centre, whose revival dates back to the emergence of unregulated financial markets in 1957, known as the Euromarkets (Burn, 2005; Altman 1969; Hanzawa 1991). Within a short space of time, British jurisdictions such as the Channel Islands, Caymans and Bermuda, as well as former colonies including Hong Kong, Singapore, Cyprus and Dubai, have evolved into ancillary offshore financial centres (OFCs) with close links to the London money markets. London's success since then has been due largely to its highly permissive regulatory environment and the established links with the network of former colonies turned financial havens (Palan 2010; Palan 2016).

These two streams of academic arguments have largely evolved in contraposition to one another. It is typically believed that IFCs develop *either* at the heart of large and sprawling manufacturing and commercial centres (such as New York, Tokyo, Shanghai, Hong Kong, Paris and Frankfurt, known colloquially as 'onshore' financial centres), *or alternatively*, as a result of context-based discriminatory practices which may explain the rise of OFCs such as Zurich, Cayman Islands or Bermuda.

In this article we inquire to what extent the two theoretical positions can be reconciled. Our key premise is that London's dominant position in the global financial system is an anomaly. Unlike any other contender, the City of London has been able to fuse together, in a mutually reinforcing dynamic, two distinct sets of criteria for an IFC. On the one hand, capitalising on its historical position at the heart of the British Empire, London developed a wide range of scale economies and market efficiencies. On the other hand, London is able to serve as a unique offshore financial hub due to a series of discriminatory regulatory practices that are tailor-made for specific segments of finance. The case of London suggests that when a large and sprawling traditional financial centre is further supported by the institutions and practices of offshore financial centres, it builds into a globally spanning financial hub that uniquely benefits from scale economies, political stability and skills agglomeration, as well as from a highly benign regulatory and fiscal environment. No other leading financial centre can lay claim to having been able to satisfy all of these requisite criteria to the same degree.

The paper presents three case studies to substantiate the argument: (a) those pertaining to the market for international loans and deposits; (b) the forex (FX) and over the counter (OTC) derivatives markets; and (c) the area of asset and collateral management. Each of these cases suggests that the competitive lead of London in modern finance is based on scale economies, established institutional links with other financial hubs as well as human skills, combined with discriminatory practices and regulatory or fiscal advantages. Together, these three areas establish a competitive lead in terms of market depth, liquidity and scale economics of financial innovation, making the City of London a unique ecosystem in global finance.

The Growth of Financial Centres

Early theories of financial centres have tended to associate their rise with the dynamics of the underlying economy and the specifics of geographical location (e.g. Christaller 1966). In this

framework, the growth of a financial centre was constrained by geographical conditions and predetermined by the success of the manufacturing or services, which ultimately left little room for political action in guiding the development of a financial centre. Charles Kindleberger's (1973, 1974) seminal study of the rise of world financial centres, while rooted in the economic rationale, would move academic understandings away from geographical reductionism, and towards a more nuanced reading of a financial centre that can thrive due to a combination of economic, logistical, infrastructural and other factors.

Kindleberger described the development and the geographical spread of IFCs as a variant of Marshallian district theory (Marshall 1990). He suggested that successful IFCs develop by balancing the benefits of market efficiencies and scale economies on the one hand, against geographical, informational and business practices (or context-based institutional assumptions), on the other. More specifically, Kindleberger considered economic (deep pool of available capital, economies of scale, headquarters of MNCs), infrastructural (central location, administrative capital, transport) and socio-political factors (history, tradition of banking and regulation, culture) as forces that can enable the agglomeration of capital and skills that would endow a city with the capital sufficient to be able to anchor a segment of the world financial system. Despite being critical of the reductionism of the earlier writers, Kindleberger himself did not see governmental policy as a definitive force in the development of an IFC:

> "Governmental policy can accelerate the emergence of a given city as the primary financial center, it can slow the process down, but it can probably not change the outcome. Too strongly pressing centralization will create resistance, and strong efforts for decentralization can be overcome by private forces" (Kindleberger 1973: 93).

Interestingly, writing amidst the currency turbulence of the early 1970s and analysing the early steps towards European financial integration, Kindleberger believed that it was Brussles, rather Zurich, Frankfurt or Paris, was the leading candidate for the mantle of the financial centre of the fledgling European Economic Community.[1]

[1] Kindleberger's analysis of London's prospects was more sceptical, although insightful as to the timing of a possible change: "Sterling is too weak, and British savings too little available to advance London's claim for consideration. The advantages of centralization are less compelling than they were in the middle of the 19th century. They still exist. Despite cultural resistance, and only with difficulty, I predict centralization will take place, but not before the late 1980s" (Kindleberger 1973: 93-94).

Kindleberger published his study just as the Eurodollar market was sprouting out of London and assuming an increasingly central role in the architecture of global finance. Yet it would take some time for the phenomenon of OFCs to become widely known. The impetus would come from the publication of new statistical data on international banking activities by the Bank of International Settlements (BIS) in 1982. This data alerted observers to the importance of offshore financial centres, in particular the Cayman Islands, as serious contenders to the traditional financial centres. Table 1 presents BIS locational statistics as of March 2006. In addition to the apparently unassailable position of London, the table shows the strength of the Cayman Islands (ranked fifth in 2006), as well as other OFCs, including Jersey, Guernsey, Bermuda and the Bahamas.

Modern theories of international financial centres descend from Kindleberger's seminal study. The mainstream economics literature has tended to dismiss the rising OFCs as mere artefacts of tax and regulatory discriminatory practices largely by virtue of analysing this phenomenon through a functional lens. Y.S. Park, for example, has argued that OFCs developed not in competition with the scale economy-based financial centres, but in conjunction with them. 'It would be cost inefficient', he maintained, 'to establish an elaborate infrastructure of international finance in each country to service just one national market. By locating most international banking and financial infrastructure in one central place, banks can spread their overhead costs in servicing clients in various countries' (Park 1982: 32). This geographical concentration of infrastructure, he went on to argue, helped to promote a division of labour among international financial centres: thus 'primary centres' such as London and New York are fully functioning capital markets centres; 'booking centres' such as the Bahamas or the Cayman Islands are specialist 'registration havens' for Euromarkets transactions; other OFCs such as Singapore or Panama developed as 'funding centres' into which Euromarkets funds tend to be channelled; other OFCs again (e.g. Bahrain) are 'collection centres' that are engaged primarily in channelling regional funds into the Euromarkets.[1] The trend towards OFC specialisation was subsequently supported by research at the Bank of England. Dixon (Dixon, 2001) confirmed Park's assessment by demonstrating that 'financial intermediation undertaken by entities based in any OFCs is almost entirely 'entrepot' (Dixon, 2001, p.105; Goodfriend 1988). Similarly, a BIS study acknowledged the increasingly cooperative nature of modern international finance by noting that the large IFCs

serve as global hubs for financial activities, linked as it were, to the secondary centres (Goetz 2007).

An alternative explanation for the division of labour among financial centres is presented by Gehrig (2000). 'Trade in informationally sensitive securities', he argues, 'is likely to be geographically concentrated at those locations where information about those securities is aggregated and communicated. In contrast, trade in standardized securities is more likely to be footloose, reacting more sensitively to (regulatory) cost differentials' (Gehrig 2000: 417-8). In other words, Gehrig believes that financial centres are differentiated not only along functional lines outlined by Park but also according to the nature of the financial assets. Thus innovative and highly complex products tend to be traded in scale economy-based financial centres due to the advantages conferred by skills agglomeration and liquidity, leaving the more standardized products to be traded in the OFCs. However, it not clear from the data whether trade in standardized instruments is deserting the primary financial centres. FX swaps for example, as will be seen below, are highly standardised FX transactions and yet continue to be channelled through leading centres such as London. At the same time, some OFCs such as the Cayman Islands and Jersey are known to be important centres of trading in highly informationally sensitive securities and to have become important registration centres for the hedge fund industry.

IFCs are not only an economic phenomenon but also an important pillar of the global financial architecture and geography (Cohen 1998; Germain 1997; Langley 2002). In contrast to economists, political scientists pay greater attention to the evolution and diversity of IFCs as illustrations of the complexity of the state/market relationship in an increasingly interconnected world. Some argue, for instance, that OFCs encourage a 'race to the bottom' in international financial regulation that creates a regulatory vacuum that has, in turn, contributed to the global financial meltdown of 2007-9. Others suggest that these financial nodes are symptomatic of the complexity of political processes in an interdependent world, and seek to explain the failure of the advanced industrialised countries to mount a serious challenge to these centres (at the very least until recently, although the jury is out) by the existence of powerful political and economic interests (e.g. Clarke and O'Connor 1997). Such theories are predicated on the assumption that financial actors gravitate towards locations that offer substantial cost reductions through the beneficial effects of positive externalities. Since those externalities include regulation and taxation, successful centres are

those whose governments have introduced the requisite policies in these areas (Dharmapala & Hines, 2006; Baldacchino, 2006; Hampton, 1996).

Today, most political economists would probably agree that the success of a emergent financial centre depends on its ability to facilitate capital funding, trade and risk management beyond the borders of a given nation-state. Saskia Sassen (1999) for instance, has identified two sets of factors that can help an ordinary city become a world financial centre: national consolidation, including agglomeration of capital and infrastructure, and market liberalisation. At the same time, commenting specifically on London's prospects in the emergent Eurozone, Sassen predicted that the City of London will thrive as a European and global financial centre on par with New York, because 'London's competitive advantage lies in its 'unique *denationalized platform for global operations*… One important factor is its flexible regulation policy, which basically leaves wholesale financial traders alone and concentrates only on retail finance to protect consumers" (Sassen 1999, emphasis added).

The evolution of the global financial system during the past 20-25 years would prove such an insight was correct. Even in the face of new competition from emerging regional financial hubs in Dubai, Singapore, Hong Kong and other havens, London has strengthened its role as a global financial centre. At the same time, the emphasis of many mainstream accounts of this continued leadership of London as IFC on scale efficiencies and flexible or accommodating regulatory policy tends to occlude the role of a more proactive discriminatory niche strategies that make London a unique 'inshore offshore' centre for capital. Below we unpack this argument, focusing on three specific areas of global financial activity.

Re-emergence of London as a global financial centre

In his book, the *Re-Emergence of Global Finance*, Gary Burn (Burn, 2005) argues that the decline of London was arrested due to the emergence of wholesale loan market in 1957 known as the Euromarket ironically, for reasons that were directly linked to the collapsing British empire. Faced with mounting speculations against the pound after the Suez Canal fiasco of 1956, the British government imposed strict restrictions on the use of sterling in trade credits with non-residents. Many City banks, primarily long-standing commercial banks that have established themselves as specialists in international lending (particularly to British Imperial outposts and the so-called British informal empire in Latin America) saw their core

business disappear overnight. They responded to the new restrictions by using US dollars in their international operations, explaining to a receptive Bank of England that such transactions have no bearing on UK balance of payment issues. At this point in history, the precise policy and legal steps that enabled and gave impetus to the Euromarkets become somewhat vague. It appears that (without any consultation with the British Treasury) the Bank of England had decided that it would not intervene in transactions that were undertaken between non-residents and that involved a foreign currency. The currency concerned at the time was the dollar, but other foreign currencies were subsequently included under this category. Congruent with English common law, the Bank classified certain types of financial transactions undertaken between non-resident parties and in foreign currencies as non-UK transactions. However, as these transactions were in actual fact taking place in London, and as they could not be regulated by any other regulatory authority, they effectively ended up in a regulatory black hole. This black hole, soon to be joined by others and to be known soon as the offshore financial markets or Euromarkets, was the most important enabling factor behind the rise of London as a global financial centre in the 20th century (Burn 2005).

The Euromarkets initially occupied a peripheral position in the global financial system. Then - in what turned out to be a crucial tipping point in 1963 - the Kennedy administration in the US proposed a tax to counter the flow of funds to the Euromarket, a policy measure that achieved the exact opposite result of what was intended. The measure in question was the Interest Equalization Tax, a 15% tax on interest received from investments in foreign bonds, which was intended to make investment in such bonds unattractive to U.S. individuals or institutions. What in fact happened was that US corporations avoided paying the interest equalization tax by refusing to repatriate funds, thereby fuelling the growth of the London Euromarkets. Thus while the unregulated international lending market emerged somewhat haphazardly, it gradually expanded to embrace the bond market and by 1963 gained support of the British state (Sylla 2002).

The emergence of the Euromarket phenomenon alerted scholars to the fact that the importance of discriminatory practices to the development of financial centres ranked alongside the importance of traditional scale economy and agglomeration advantages. On the basis of these forces, London financial houses were able to reduce a crucial fixed cost dimension of trading in incorporeal assets, namely, the regulatory dimension. In effect, London seized the initiative in the development of the wholesale international financial markets, an initiative to which other centres had to respond as evidenced by subsequent

developments. Contrary to popular perception, the US Treasury initially objected to the rise of the unregulated market in London and put forward proposals for a new regulatory framework (Kapstein 1994). When these proposals came to nothing, the US Treasury (with the active encouragement of the New York banking community led by Citibank and Chase Manhattan) came to the conclusion that rather than resist the emergence of an unregulated global financial market, the US stood to gain by encouraging a domestic offshoot of this offshore market. Clear manifestation of the swift volt-face that took place was the establishment on 3rd of December 1981 of the New York offshore market, the New York International Banking Facilities (IBF), a local, albeit more restricted, variant of the London offshore market. Just as the US IBF was set up as a defensive measure on the part of U.S. government regulators seeking to 'internalize' the Euromarkets into the U.S. banking system, so also was this true of Japan that followed suit in 1986 by establishing its own IBF, the Japanese Offshore Market (JOM) (Moffett and Stonehill 1989; Hanzawa 1991).

By the 1970s, it had become clear that the success of London as a major financial capital was built on central two pillars: an historical concentration of professional and technical know-how in international finance on the one side, and the rise of the unregulated Euromarkets on the other. This said, London had some disadvantages. First and foremost of these was the fact that while London's financial market was largely unregulated or 'offshore', British banks, which were among the core institutions of this market, were still subject to corporate taxation. Second, while British banks could not pose as non-residents for taxation purposes, American and other foreign banks could benefit from transfer pricing to ensure low taxation thus giving them an important competitive advantage over their British counterparts. Third, as London's offshore market grew in size and complexity, the cost of conducting business in London became an additional vexing issue.

These conditions heralded in turn the next pivotal step in the global ascent of London as a financial hub. As the City transformed itself into a large and flourishing OFC, or a conduit through which bankers, increasingly of American, Japanese and German origins, have learned to register financial transactions to avoid various regulations, the idea of using other, closely related jurisdictions sharing British law and regulations but having the added advantage of low taxation, seemed logical. In expanding operations internationally, London institutions appear to have sought the path of least resistance, selecting British imperial polities that broadly resembled the City of London's unique political structure. As a result, the Euromarkets never developed in the larger British imperial possessions or dominions such

as Canada, India, or Australia, but in typically quasi-feudal polities such as the Channel Islands, and other small British dependencies. This resulted in a network of British—dominated financial centres with close links between them.

In sum, if the City of London originally developed as a scale economy-based financial centre, it was the subsequent deployment of favourable discriminatory practices that helped it to consolidate its key position in the global wholesale financial market. Table 1 shows the enviable position achieved by the UK by 2006 in the original Euromarkets segment of the international market for loans and deposits. The position of many of the financial centres captured in this tables is understandable. The figures for Germany, to take one example, show US$ 2,794 billion in claims and US$ 1,722.0 billion in liabilities, while the figures for Japan, to take another example, shows US$1898 billion claims and US$ 681.4 liabilities. These figures are typical for large exporting nations. Meanwhile, the figures for the US shows US$ 2,305 in claims and US$ 2,819 in liabilities while for Australia they show US$ 146.8 billion claims and US$ 380.1 billion in liabilities; in other words, figures that are typical of borrowing nations. In contrast to all of the above, the figures for the UK and British OFCs are better balanced, which suggest that these are largely conduit centres. Table 2 presents an amalgamated position of the UK and its linked possessions including the Chanel Islands and the British Overseas territories. The 'British state', as this amalgamation may be called, accounts for about 30% of the market for loans and deposits. If we include recently independent colonial possessions like Singapore and Honk Kong, the figure rises to 36%.

It is also interesting to observe the growth of this market from 2006 to 2015 (tables 3 & 4). A comparison of Tables 1 with 3, and 2 with 4 reveals three developments. The first is that the financial crisis of 2007-8 seems to have given impetus to a more intensive battle against tax abuse. While the G20 London Summit in April 2009 heralded a new era of apparent political willingness on this issue, the initial reality was a continuation of the pre 2008 regime as the focus was on the use of soft law i.e. the use of black lists of tax haven jurisdictions and the like. Nevertheless, the growing number of measures introduced against tax evasion and avoidance appeared to have rendered OFCs less attractive in this particular market segment. The second development, as was to be expected, was the rise of East Asia and emerging markets. The third development was, as can be seen from the tables, a marked corresponding shift of this market segment from OFC to onshore centers in Europe.

TABLES 1 & 2, 3 & 4 HERE

There has been considerable discussion of the changing nature of global cross-border bank lending in the past few years. Cerutti (Cerutti, et al., 2014) for example, document the changing composition of cross-border lending between syndicated and non-syndicated loans. (Avdjiev & Takats, 2014) analyse the decline of cross-border bank lending to emerging markets, while (Hills & Hoggarth, 2013) discuss prudential implication of the market. We could not find a corresponding discussion that explains the relative decline of London and its satellite OFCs in the past few years in this market. Our hypothesis is that the measures discussed above, taken in conjunction with the competition from New Yorks' IBF and Tokyo's JOM have eroded, but not eliminated, the discriminatory advantage of London and British controlled tax havens in this particular market segment of the international financial system. However, as we shall now demonstrate below, this negative trend has been counterbalanced by London's strengthening of position in other market segments of the international financial system.

London's position in the global FX and OTC derivatives markets

According to the most recent BIS triennial survey of the FX markets (BIS, 2016), daily foreign exchange turnover averaged $5.1 trillion, with the overwhelming majority of this turnover occurring in just five jurisdictions: the UK (37%), the US (19%), Singapore (7.9%), Hong Kong (6.7 %) and Japan (6.1%). The dominance of the UK and the US in the FX markets can be traced partially to the speculative trading activities of the hedge funds that are based (or managed) in London and New York. Faced with the task of generating above average returns (for which they charge, in return, above average fees) for their clients (traditionally wealthy individuals but also now increasingly institutional investors) hedge funds rely heavily on speculative currency trading as one of the principal means of achieving these returns. It is estimated that hedge funds account for over 50% of spot currency trade in London and New York due to their use of sophisticated computer software and server proximity to exploit any exchange rate disturbances. As these disturbances are likely to be very small in the case of the most widely traded currencies (the US dollar, the euro, the UK pound, the yen and the Swiss franc between them account for over 92% of total daily FX turnover) given the depth and liquidity of the markets for these currencies, hedge funds trade

these same currencies many times over, up to fifty times a day, so as to make any substantial profits (BIS, 2011).

As New York rivals London as a home to hedge funds and their automated, high frequency currency trading, there has to be a further significant reason why London's share of daily global FX turnover is more than twice that of New York's. That reason is chiefly to be found in the FX swap segment of the currency markets. FX swaps, which accounted for 47% of global daily FX trading volume in 2016, are transactions that combine spot and outright forward transactions between the same two counterparties and involving the same two currencies, e.g. the sale of an amount of dollars today for an agreed sum of euros is coupled with a commitment to repurchase the dollars with an agreed amount of euros at some point in the future. FX swaps serve two basic functions: on the one hand, they represent a cheap, collateralized form of borrowing a foreign currency; on the other hand, they represent an alternative type of repo (repurchasing agreements) in that institutions wanting to borrow cash in their own currency can use a foreign key currency such as the dollar rather than government bonds as collateral. Although FX swaps are now used in both functions in most areas of the world, it is in the Eurozone area where their use is heaviest as indicated by the unusually high ratio of inter-dealer FX swaps in the Eurozone: 67 per cent as compared with a rest-of-the-world average of 39 per cent (ECB, 2010). On the one hand, Eurozone commercial banks continue to hold substantial quantities of US dollar-denominated bonds and short term paper to boost yields and use FX swaps to manage their currency risk exposure, while on the other hand Eurozone banks' dependence on the use of FX swaps as a substitute type of repo has increased following the Eurozone crisis due to the damage done to the financial position of many Eurozone governments. The irony is that although the UK is not in the Eurozone, by far the largest proportion of Eurozone FX swap transactions are conducted in London where the FX swap market is the deepest and most liquid and thus where the costs of executing these transactions is lowest.

Considerations of costs and convenience also help to explain London's large percentage share of the global over the counter (OTC) interest rate derivatives market, which stands at 48% according to the last BIS triennial survey. Derivatives are financial instruments that are used by a wide array of financial institutions to either hedge against, or alternatively speculate on, risk. While there are several other types of derivatives, including FX derivatives, credit swaps, and equity derivatives, interest rate derivatives are by far the most important (typically accounting for between 80 to 90% of the entire market), a fact that

largely ties in with the exigencies of institutional asset management. Although there are other users of interest rate derivatives, including non-financial corporations and governments and their agencies, it is insurance companies and pension funds that are, alongside the banks, the heaviest users of these products. This is because their long dated liabilities resulting from pension and annuity products have very large interest rate exposures that can prove costly in the face of even the smallest changes in interest rates, a problem which is compounded by the fact that on the asset side of their balance sheets insurance companies and pension funds typically hold securities that have a different return-risk profile to their liabilities. In order to reduce this mismatch, interest rate derivatives are used by insurance companies and pension funds to hedge their liabilities by providing them with products whose values move in the opposite direction of those associated with any interest rate changes.

Although exchange traded derivatives are cheaper because they are bought and sold wholesale on a formal exchange (such as Chicago's CME Group, the world's largest exchange) their standardised nature renders them unsuitable for the particular needs of individual asset managers. Over the counter (OTC) derivatives are more appropriate in this regard because they are off-exchange products that are negotiated and traded on a bilateral basis and thus can be tailored to fit customer's needs. However, as end-users are unlikely to have exactly equal and opposite needs that can be matched easily, the large commercial banks play a crucial intermediary role in the OTC derivatives market in that they occupy the opposing sides of OTC trades. The risks undertaken by banks in these trades with clients are pooled together, with this aggregate risk pool then typically being hedged in the wholesale exchange traded derivative markets. Now if we take into account that insurance companies are heavy users of interest rate swaps and that Europe has the largest share of the global insurance market (35%, as compared with 28% for the US) and add to these observations the fact that London has one of the largest concentration of commercial banks in the world, we can see why London is the foremost centre of the global OTC interest rate derivatives markets. It can be noted once again that although the UK is not in the Eurozone, by far the largest proportion of euro-denominated derivatives (an average daily value of $573 billion in 2016, according to Intercontinental Exchange (ICE)) are cleared by London-based platforms.

London's predominant shares of Eurozone FX swap transactions and European OTC interest rate derivatives transactions has been a cause of envy if not also of concern amongst the political and financial elites in Frankfurt and Paris. However, the huge gulf separating London as the world's premier IFC from Frankfurt and Paris as relatively minor continental

European financial centres is a direct reflection of the diametrically opposed approaches to financial regulation. As we mentioned above, London has long been a major IFC because the two broad sets of factors required for any geographical location to become a viable financial centre – the 'economic' set (scale economies, skills clustering, etc.) and the 'political' set (light touch regulation, benign legal and tax environments etc.) – are inextricably fused together in London in a mutually reinforcing dynamic: the benign political factors including discriminatory regulations attract large numbers of foreign financial institutions which give rise to scale economies, while the fact that the agglomeration of these institutions brings various benefits (e.g. employment benefits, knowledge externalities) to London facilitates the development of further discriminatory regulations and niche policies. By contrast, in Germany and France and other continental European countries the political and economic sets of criteria necessary for a viable financial sector have been locked together in a relation of mutual tension and conflict. The governing authorities in these countries – unlike their British counterparts – have tended historically to favour 'industrial sector' interests over the 'financial sector' interests. The weight of history has been important here: to protect the interests of their domestic manufacturing corporations, Paris and Frankfurt sought tighter financial regulation to ensure that finance serves the real sector rather than the other way round; but this tighter regulation then acted as a deterrent to the clustering of financial institutions which then raised the costs of trading financial products. It was these higher costs that in turn induced European financial institutions –and principally their banks and insurance companies – to divert their financial activities through London.

The question that is inevitably raised by the above discussion is whether the situation will change following Britain's narrowly contested decision to leave the European Union. At the time of writing, it is unclear as to how exactly Brexit will affect London's position as a major centre for conducting transactions in euro-denominated financial instruments and services over the longer term. This in turn, may influence London's position as the world's leading IFC. The heart of the matter here comes down to the contest between regulatory issues on the one side and liquidity issues on the other. As noted, there is a desire amongst the European political and financial elites to move euro-linked financial business back to Paris and Frankfurt. The clearest example of this desire was the recent attempt by the European Central Bank to force the relocation of banks involved in the clearing and settlement of euro-denominated transactions into the euro area. Although the ECB lost its case at the European Court of Justice in 2015, it has again given notice that it will be difficult for the UK to hang

on to its valuable euro-clearing business following Brexit. However, even if London loses its legal protection against the relocation of euro-related business, it is unlikely that such a relocation will occur any time soon because what ultimately matters for financial institutions of whatever nationality is the costs of doing financial business, and the cost advantages of London that are conferred by the sheer depth and liquidity of its financial markets are not likely to be matched by any other European financial centre in the immediate future for the reasons cited above.

London as the Global Centre for Asset and Collateral Management

The longevity of London's reign as a premier centre for finance is in large part, due to its dynamism: major historical shifts within the global financial system were reflected in the shifts within the City. Over the past three decades, two inter-related processes have defined the global economy: the transformation of the banking system (from the 'originate to hold' to the 'originate and distribute' model of banking) and the shift away from bank-dominated to market-based financial intermediation. In the run up to, but especially after, the 2007-09 crisis, these two tendencies heralded the rise of global capital markets (as opposed to bank-based finance) as major sources of funds. In what follows, this section explains why in the international capital markets, London's global lead – just like in FX trade and cross-border lending - is due to the historical concentration of infrastructure, liquidity and skills, enabled and encouraged by targeted regulation and discriminatory niche policies.

Capital markets are markets for buying and selling financial instruments. Spanning many types of securities,[2] capital markets tie together bank and non-bank financial intermediaries, providing funding and risk management services to a variety of firms, banks and other financial institutions. In this process, the activities of capital markets – including raising new capital and managing existing portfolios - link together asset managers and a wide range of other financial institutions, including commercial and universal banks, investment banks, trust companies, insurance companies, private banks, captive and independent pension fund managers, mutual fund companies, and various types of specialist firms (Walter 1999: 1-2).

Since the mid-1990s, asset management has been one of the most dynamic segments of the financial system, hang expanded from $30 trillion in 1997 (Walter 1999) to $71.4

[2] Principally, equity and debt.

trillion in 2016 (BCG 2016). Overall, during the post- WWII period, assets under management (AUM) have risen across most OECD countries; most prominently in the USA and, in a much shorter period of time, in the UK (Haldane 2014). On average the industry has been growing by 13% per year, and despite having stalled at just over $71 trillion in 2016, is anticipated to expand further[3] (BCG 2015; Credit Suisse 2015; IMF 2015).[4]

This expansion has been driven by demographic changes in the advanced economies and reforms of the pension systems, the trend towards greater diversification of portfolios, away from selections dominated by domestic assets and towards more cross-border, internationalised holdings of securities and the recent professionalisation of wealth management (Walter 1999; Harrington 2016). Throughout history, these trends were uniquely accommodated by the deep and diverse pool of capital, technology and talent in the City of London, and have been further reinforced by post-2009 shifts in finance. Two specific mechanisms are key to understanding this process: liquidity and collateral management.

Raising capital, or funding, centers on the process known as liquidity transformation. It involves the provision to investors of liquid claims that are typically backed by illiquid assets, and is a key function of many financial intermediaries. Historically, liquidity transformation has been primarily performed by banks, which would hold illiquid loans but give investors liquid deposits (Chernenko and Sunderam 2016: 1). However, even before the 2007-09 crisis, asset managers provided similar services, partly by being able to create short term liquidity from illiquid assets by using them as collateral in capital market operations. Post-2009, in the wide range of regulatory initiatives, it is Basle 3, aimed at raising capital and liquidity requirements for the banking sector, which has been the most consequential (Manna 2015). Responding to Basle 3, banks and financial institutions had to minimise their reliance on unsecured finding and instead rely much more on collateralised transactions. This in turn, has made collateral management and the attendant capital market mechanisms that facilitate it, fundamental to the operation of the financial system and financial stability.

As a sub-set of wealth management sector, the asset management industry is dominated by three principal types of professional managers of funds: mutual funds, pension funds, and private-client assets, as well as foundations, endowments, central bank reserves and other large financial pools requiring institutional asset management services, such as for

[3] Credit Suisse (2015) predicts that global AUM is set to grow by 40% in the next 5 years.
[4] Haldane reports that in the United States, AUM have risen almost fivefold relative to GDP since 1946, from around 50% of GDP to around 240% of GDP. In the United Kingdom this pattern has been replicated, but over a much shorter time period, since around 1980 (Haldane 2014: 2-3).

instance, sovereign wealth funds (SWFs) (Walter 1999). Together, hedge funds, pension funds, insurance companies and alternative investors operating out of London control £4,230 bn of assets (Burrows and Lowe 2015). At the same time, they are reported to have more £15 trillion of assets under management (UKTI 2015: 8). This latter figure accounts for about a quarter of global assets managed professionally, currently estimated to be around $85 trillion (BCG 2015; IMF 2015) and makes London the second largest fund management market in the world (UKTI 2015). In various international surveys, London tops the list of most desired destinations for fund management, ahead of Hong Kong, Singapore and New York. This unique niche is confirmed by the Global Financial Centres Index (Table 5). Globally, "the UK's share of the global hedge fund industry more than doubled in the decade up to 2011 to 18 per cent, when 85 per cent of European hedge fund assets were managed out of the UK" (UKTI 2013: 5).

Insert Table 5 about here.

Two specific mechanisms of capital markets – the market for repurchase operations (repos) and collateral management – help us understand why the concentration of liquidity, skills, informational and technological capital makes London so central for these two areas of capital management. Collateral and liquidity management has been defined 'as the optimal management of credit, collateral, capital and all related execution, pricing, operational, documentation, and risk management of a portfolio across all products, all business units, and all locations' (Hill 2015: 6, Box 1). Repo markets, best understood as markets for short-term secured loans, are essential to the efficient market funding and balance sheet management. The repo market (estimated European size is 6 trillion euros, compared with $10 trillion in the USA) is the lifeblood of modern capital markets.[5] Although the complex network of repo transactions is dominated by banks, they form part of the larger collateral chain that ties together the banking sector, asset management, institutions typically associated with 'financial plumbing', as well as real economic assets. London is a premier global platform

[5] Repos, or securities financing transactions, involve a temporary loan of cash guaranteed by collateral. Banks use the repo market in order to fund their balance sheets. They do this by borrowing cash from investor (e.g. money market funds), in exchange for pledging bonds and other securities as collateral. Repo contracts tend to be very short term in nature (overnight or a few days), hence the repo markets acts as the main place to source and mobilise collateral, also acting to link securities and derivatives markets. This makes repo market the primary source of inter-bank lending a vital node in the infrastructure of financial transactions and the fluidity of collateral (ICMA 2015; Singh 2010).

facilitating collateral management and capital market lending due to, first, existing economies of scale and scope, and second, as a result of nuanced and targeted regulatory provisions.

With its developed network of relationships and wide scope for efficient international services, the City accommodates a great variety of capital raisers and securities dealers and is a crucial node in global capital market infrastructure.[6] Today the UK is home to branches of all major global banks and several key clearing houses. Together, 15 global banks employ almost 70,000 people in London, with 5 largest US banks – Goldman Sachs, Bank of America Merrill Lynch, Citi, Morgan Stanley and JP Morgan – employing 30000 staff in London (Noonan 2016). And while London-specific data on repo transactions may suggest a relatively modest size of $800 billion (Manna 2016), the importance of repo and other types of securities financed transactions can be appreciated in the context of collateral management.

In the post-2009 regulatory context, collateral management has become inseparable from liquidity management and risk management for both the users and the facilitators of capital markets.[7] As Hill puts it simply, collateral is the new cash (Hill 2015: 5). But it is not only due to post-2009 regulations that collateral services have grown in scope and importance. Professional investors, confronted with the yield problem in the context of low and negative interests rates, have come to rely on short-term capital market instruments in order to deliver the returns for clients whose assets they manage (Claessens et al 2012; Lysandrou 2012; Lysandrou and Nesvetailova 2014; Lysandrou and Shabani 2016). The scarcity of high-quality collateral necessary to finance transactions in capital markets was first identified as a global problem in 2010 (Singh 2010), and it has continued to daunt markets and regulators since. Current estimates by the private sector put the need for high quality collateral between $1 - $2.5 trillion (Treasury Strategies 2015) whereas some regulators estimate it to be as high as $4 trillion (CGFS 2013).[8]

It is beyond doubt that the existing scale and competitive advantages in banking-related related services help to account for London's premier position as a global hub for collateral and liquidity management. London, with its developed banking network, advanced legal infrastructure with its historically close links to finance, as well as technological and human

[6] OFR researchers estimate the global market at about $3.4 trillion in repos (in which dealers sell securities and receive cash) and $2.4 trillion in reverse repos (in which dealers deliver cash and receive securities).
[7] Collateral therefore, is an intrinsic feature of the modern financial system, whether securitizing loans, collateralizing repo transactions (including central bank money market operations), or margining OTC derivatives trades (Hill 2014).
[8] CGFS, 2013, "Asset encumbrance, financial reform and the demand for collateral assets", CGFS papers, No. 49.

resources necessary for these activities, is a vital hub where collateral, liquidity and risk management network coincide to create a leading global centre for asset management (including collateral management): today 'more assets are managed through London than any other place in Europe" (UKTI 2015: 5). The unique concentration of factors attracts overseas capital: 40 percent of the asset management firms in London are owned by overseas investors; more than a third of funds, or some £2.2 trillion, are held on behalf of overseas investors (UKTI 2015). According to the Bank of England, while the hedge funds captured by UK regulatory scope are managed from the United Kingdom, the funds themselves are typically domiciled overseas (Burrows and Low 2015: 123).

London's deep, liquid money and capital markets, and the City's historical position as leader in bank lending and the provision of a variety of financial and legal services, primed it to accommodate the interests of a vast range of sovereign and corporate borrowers (Hill 2014: 5). These scale economies help explain why London has become the capital of the global M&A boom of the past few years, estimated at $4 trillion worth of deals in 2015. With global value of cross-border deals estimated at $1 trillion, London has been at the centre of the corridor between North American and Europe, where a third of cross-border M&A deals were registered (Deloitte 2015). The unique concentration of financial, legal and accounting expertise in London explains its lead in the M&A sector, where transactions tend to be 'large, cross-border and often high-profile' (Massoudi 2015: 46).

Scale economies also help explain why London is an important centre in the management of sovereign wealth funds' assets, as a clearing house and a location where a number of these funds are managed. A number of large Sovereign Wealth Funds (SWFs) such as the Kuwait Investment Authority, Brunei Investment Agency, Abu Dhabi Investment Authority and Temasek/General Investment Corporation of Singapore have local representative offices in London. The International Forum of Sovereign Wealth Funds, a group of 26 funds led by China, Russia and the Gulf States, has its Secretariat located in London (UKTI 2015: 19). While the UK and US each accounted for around 16% of the $800 billion invested by SWFs since 2007, in relation to the size of its economy, the UK attracted over five times more investment than the US. According to the report by the Sovereign Wealth Fund Institute, in 2014, global assets under management of SWFs increased by 16% to a record $7.1 trillion, with direct investments by SWFs amounting to $117 billion – the second highest annual amount invested on record (CityUK 2015).

At the same time however, scale economies and the concentration of competitive advantage factors provide only a partial account of London's continued global lead in

financial innovation and investment. Regulatory niche policies have been key to sustaining the exceptionally high volume of financial activity in London, particularly in the area of asset and collateral management.

At first glance, compared with its major rival – New York's Wall Street - London's regulatory advantage is subtle. The UK has been subject to pan-European rules and regulations that traditionally are thought to be more restrictive than in the US (Posner and Veron 2010). Yet it is the exceptions to the European regulatory norms that continue to shape UK's relationship with the EU regulators, and which constitute an important regulatory lacunae for the City of London. Post-2009, as the EU regulations tightened, the City of London sought to carve out exemptions from the post-crisis regulation of derivatives, hedge funds, and rating agencies that limited access of non-EU firms to capital markets, in order to preserve the role of London as the primary hub of non-EU firms in the European markets (Pagliari 2013). While recent literature has mostly focused on the regulatory lacunae in the area of derivatives regulations (Quaglia 2007, 2015; Mugge 2014), the case of collateral rehypothecation (colloquially known as collateral churning) is particularly significant in the post-2009 context and the rise of non-bank financial sectors.

The UK rules that guide asset management operations are quite restrictive: prime brokers, for example, are prohibited from commingling their own funds with those of their clients when carrying out their daily operations. However, the UK regulations provide several key exceptions that allow brokers to avoid these prohibitions (Deryugina 2009: 268-69). As a result of such exceptions, prime brokers customarily commingle client cash with their own funds; similarly, most hedge funds are allowed to commingle funds when operating on behalf of a professional client[9] (Deryigina 2009: 270). Interestingly, while post-2009 there has been a tightening of regulatory rules around the 'alternative investment' industry, it is again, the exceptions that have helped London to maintain its global lead. Specifically, the post-2009 restrictions on collateral re-hypothecation limit its applicability to the 20 or so global investment firms *(*e.g., international investment banks and prime brokers) for which it is assumed to be operationally more risky to segregate client monies on receipt, given the range of jurisdictions and time zones involved (Thiede 2015). Quite literally, therefore, the scale

[9] As Deryugina (2009 explains), hedge funds frequently give custody of their assets to large investment banks that provide prime brokerage services. These large investment banking institutions—the prime brokers—administer the daily business affairs of the hedge funds. Where permitted by law, prime brokers utilise the assets of the hedge funds to execute lending and borrowing transactions such as rehypothecation (Deryugina 2009 : 255-56).

economies typically associated with large financial entities allow them to capitalise on crucial exceptions in the new regulatory requirements.

Data on the amount of collateral being re-pledged and re-hypothecated is notoriously difficult to obtain. Illustrating the scale of the challenge, as well as regulatory concerns about collateral re-use, in February 2016 the FSB launched an open consultation on the methodologies for evaluating the amount of collateral being re-cycled through the system (FSB 2016). Nevertheless, we can infer from the available global data on collateral re-use just how central London is for collateral management. According to ISDA, in 2014 cash comprised over 90% of collateral eligible for rehypothecation and more than 80% of collateral actually rehypothecated. Government securities accounted for the second most used asset class, followed by 'other securities' (ISDA 2015). Given that London is the largest global hub for FX markets as well as derivatives trades, it is reasonable to conclude that, targeted regulatory niche policies have cemented London's premiership in asset management generally and collateral management specifically.

Furthermore, in 2011-13, the UK government specifically targeted the asset management sector by offering a set of regulatory exceptions. In addition to no limits on collateral rehypothecation[10] (compared with a far more restrictive limit of 140% in USA), these regulatory niches include: fifty percent reduction in time for the FCA authorisation of a new fund; passport benefits (under EU rules, fund managers can register funds in one Member State and then freely market them across the whole of the EU); some 120 double taxation agreements, which can benefit funds domiciled in the UK and, perhaps most crucially, which include a range of tax exceptions for fund managers that are aimed to make UK more competitive than Ireland and even Luxemburg (UKTI 2013).

Just as in international bank lending and in the FX and OTC derivatives markets therefore, in the global capital markets, London has managed to fuse together the classical advantages of scale economies and targeted discriminatory practices. On the one hand, London's history as a global financial centre means that any firm operating out of London can benefit from the available efficiencies and scale economies, now multiplied across the sectors that comprise and service the finance industry. On the other hand, in the era of asset management and the post-2009 period of collateralised lending, London has reinforced these traditional sets of economic advantages by targeted policies and regulatory niche initiatives.

[10] Re-hypothecation (often used interchangeably with 're-use' and 're-pledge') refers to re-use of securities posted as collateral, in other transactions.

Conclusion

In the framework of classical theories of financial centres, London's success as a premier global financial hub is an anomaly. The size of the UK economy is disproportionally small compared to the size of the UK financial sector, and traditional economic arguments cannot explain the ascent of London as a global financial centre. At the same time, London is not a typical offshore financial centre (OFC) either: unlike booking or registration havens, London is home to a wide range of financial, clearing, capital raising and risks management activities undertaken by bank and non-bank financial institutional on behalf of a wide range of UK, European and overseas clients.

Having analysed the area of cross-border bank lending, FX and derivatives trade and the asset management industry, we have argued that London's success as a financial centre is neither due exclusively to scale economies factors, nor to discriminatory practices. Rather, a combination of conditions that are unique to London help explain why it has been able to draw on both economic and regulatory factors to bolster its success.

As a declining traditional Marshallian financial district, London benefitted enormously from the rise of the Euromarkets on the back of audacious discriminatory practices. The expanding Euromarkets sustained a return to scale economies, which, combined with London's reputation for permissive regulatory environment, placed London as the leading centre in the fledgling FX swap market. For similar reasons, and considering subtle discriminatory practices accepted in London, combined with its deep liquidity as a large whole-scale financial centre, London is also a leading centre for the asset management industry. Up to now, no other financial centre in the world has managed to capitalise on the competitive advantages arising from the economies of scale, and on subtle regulatory discrimination in quite the same way.

At the time of writing, it is far too premature to project the effects of Brexit on the position of London in the global financial topography. At the heart of any development will be the risks of Brexit to London's scale economies, and the opportunities for further regulatory exceptions afforded by the departure from EU. Ultimately though, this centres on the conflict between regulatory issues on the one side and liquidity issues on the other. The moves by EU elites to relocate euro trading back to the continent will undermine the liquidity and efficiency of London's markets. Yet it is unlikely that such a relocation will occur any

time soon: the cost advantages of London that are conferred by the sheer depth and liquidity of its financial markets are not likely to be matched by any other European financial centre in the immediate future.

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TABLES AND GRAPHS

Table 1 International Financial Centers, 2006

External positions of banks in all currencies vis-à-vis all sectors

Reporting Countries	Amounts outstanding			
	Claims	liabilities	combined	% share of total
All countries	26,094.4	24,175.0	50,269	

1.	UK	5,178.5	5,432.1	10,611	21.10%
2.	US	2,305.1	2,819.1	5124	10.19%
3.	Germany	2,794	1,722.0	4516	9.0%
4.	France	2,196.1	2,122.0	4318	8.9
5.	Caymans	1661.9	1620.0	3282	6,52
6.	Japan	1,898.5	681.7	2580	5,13
7.	Switzerland	1,122.0	1001.0	2123	4,22
8.	Netherlands	1041.5	943.0	1984	3,94
9	Belgium	819.1	889.5	1698	3.37
`10.	Ireland	891.6	753.9	1645	3,27
11.	Luxembourg	901.1	607.0	1508	2.99
12.	Singapore	603.5	606.5	1210	2,40
13.	Italy	497.5	677.5	1175	2.33
14.	Hong Kong SAR	449.9	526.0	976	< 2.0%
15	Spain	621.4	352.8	974	< 2.0%
16	Jersey	444.1	309.4	751	<2.0%
17.	Bahamas	343.3	347.4	691	<2.0 %
18.	Austria	360.8	277.1	638	< 2. 0%
19	Sweden	52.7	328.5	581	< 2.0 %
20.	Australia	146.8	380.2	527	<2.0 %
21.	Canada	242.0	208.7	451	< 1.0%
22.	Denmark	161.9	241.5	403	<1.0 %
23.	Guernsey	183.0	155.4	338	<1.0%
24.	Bahrain	159.7	153.3	313	<1.0%
25.	Finland	83.4	101.9	185	<1.0%
26.	Norway	57.7	125.1	183	<1.0%
27.	Isle of Man	77.0	51.7	129	<1.0%

Source: BIS 2006

Table 2 International Financial Centers, 2006

	COMBINED	% OF TOAL
ALL COUNTRIES	50,269	
British Empire	18,301	36.40
(Figures for the British Empire include the UK, Caymans, Singapore, Hong Kong, Bahamas, Jersey, Guernsey, Isle of Man)		
British State	15,111	30.06
(UK, Caymans, Jersey, Guernsey, Isle of Man)		
US	5124	14.9

Source: BIS 2006

Table 3 International Financial Centers, 2015

Cross-border positions, by location of reporting bank and sector of counterparty

Reporting Countries		Amounts outstanding			
		Claims	liabilities	combined	% share of total
All countries		27,365.0	24,140.5	51,505	
1.	UK	4,491.5	3,815.3	8,306	16.12
2.	US	3,118.0	4,026.2	7,144	13.87
3.	France	2,205.2	2,184.2	4389	8.52
4.	Japan	3,125.2	1,205.1	4330	8.40
5.	Germany	2,254.0	1,709.3	3,963	7.69
6.	Caymans	1,299.9	1,310.0	2540	4.93
7.	Hong Kong SAR	1,272,7	1,019.8	2293	4,45
8.	Netherlands	1,125.6	945.8	2071	4.40
9	Switzerland	863.0	828.5	1688	3.27
10.	Singapore	723.4	707.5	1430	< 3.0 %
11.	Belgium	626.5	516.6	1143	< 3.0 %
12.	Australia	444.7	679.2	1124	< 3.0 %
13.	Luxembourg	661.5	434.8	1096	< 3.0 %
14.	Italy	473.7	477.4	951	<2.0 %
15	Canada	461.9	391.9	854	<2.0 %
16	Spain	423.9	353.5	777	<2.0 %
17.	Finland	320.3	405.9	725	<2.0 %
18.	Sweden	445.3	267.0	712	<2.0 %
19.	Ireland	323.2	300.0	623	<2.0 %
20.	Chinese Taipei	359.8	199.7	560	<2.0 %
21.	Korea	223.9	255.4	479	<1.0%

22.	Austria	277.8	180.6	459	<1.0%
23.	Denmark	227.5	183.3	410	<1.0%
24.	Norway	178.0	222.7	401	<1.0%
25.	Bahamas	169.4	194.0	363	<1.0%
26.	Jersey	181.5	126.6	308	<1.0%
27.	Bahrain	138.6	137.3	276	<1.0%
28.	Guernsey	150.9	97.6	249	<1.0%
Macao SAR		112.7	82.9	196	<1.0%
Isle of Man		57.9	45.1	103	<1.0%
Cyprus		31.7	30.1	62	<1.0%

BIS 2015

Table 4 International Financial Centers, 2015

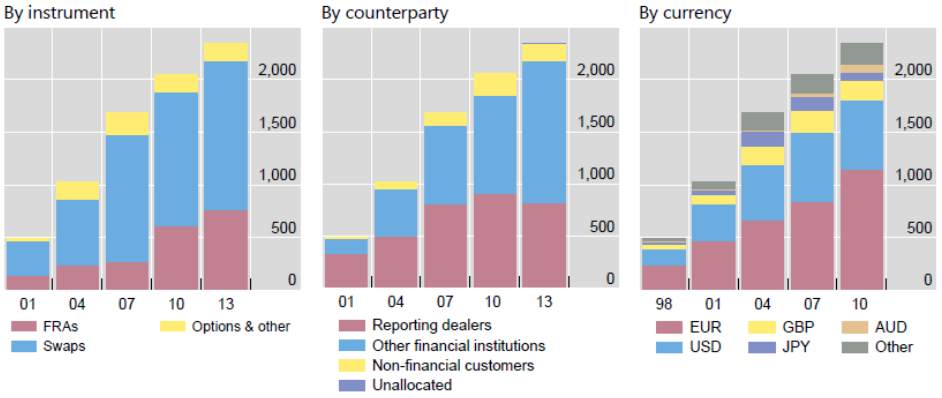
	COMBINED	% OF TOAL
ALL COUNTRIES	51,505	
British Empire	15,654 (18,311)	30.39% (36.40%)
(Figures for the British Empire include the UK, Caymans, Singapore, Hong Kong, Bahamas, Jersey, Guernsey, Isle of Man)		
British State	11,506 (15,111)	22.33% (30.06%)
(UK, Caymans, Jersey, Guernsey, Isle of Man)		
US	5124	14.9

Source: BIS 2006

written) are close to record lows in most major markets, and markets do not price in any expectation that they will go up in the near future. Trading in interest rate swaps rose 11% to $1,415 billion, or 60% of the total. Activity in options and other products fell 4% to $174 billion.

Turnover of OTC interest rate derivatives

Net-net basis,[1] daily averages in April, in billions of US dollars — Graph 1



[1] Adjusted for local and cross-border inter-dealer double-counting.

Source: BIS Triennial Central Bank Survey. For additional data by instrument, counterparty and currency, see Tables 1-4 on pages 8-10.

[1] Most derivatives markets reforms, for instance the requirement that transactions be centrally cleared, affect turnover only indirectly, with effects running in both directions. For example, lower counterparty risk owing to central clearing and higher

Table 5. Most attractive centres for relocating/expanding asset management operations

Raking	Location	Score
1	London	75
2	Hong Kong	52
3	Singapore	33
4	New York	18
5	Sao Paulo	10
6=	Moscow	7
6=	Paris	7
8	Luxemburg	6
9	Geneva	5
10=	Helsinki	4
10=	Shanghai	4
10=	Zurich	4

Source: UKTI 2013: 7.

[1] Interestingly, Park pays little attention to mid-size European financial centers for the simple reason that they had not developed as yet as a distinct group. Reed identified in 1981 only Amsterdam and Zurich among what he described as third tier financial centers. See Reed 1981. Reed's study covered a sample of 80 financial centers. He considered London at the very top, New York and Tokyo at level two, Amsterdam, Chicago, Frankfurt, Hamburg, Hong Kong, Paris, San Fransico and Zurich at level three.