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Beyond The London-Frankfurt Dichotomy. What Space For The Other European Financial Centers?

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**BEYOND THE LONDON-FRANKFURT DICHOTOMY. WHAT SPACE FOR
THE OTHER EUROPEAN FINANCIAL CENTERS?**

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ABSTRACT

I analyze the increasing competition among financial centers and discuss which policy national centers should undertake.

I develop a core-periphery model in which location is determined by the degree of markets' segmentation and by the interaction of exogenous advantages, increasing returns and market size. I show that market integration may be fatal to peripheral locations, and that agglomeration economies may generate equilibrium multiplicity and path dependence.

The current integration process finds its limit in the information contents of the financial activity, which prizes sociality, proximity and local information. Valorizing the peculiarities of the national economy a financial center can both strengthen its position and play as the main gate to the local market. Moreover, networking with other centers, it may also diversify the supply of financial products, offering the local community the most natural way of accessing the international capital markets.

KEYWORDS: Location, Agglomeration, Financial Centers

JEL: F36, G10, G20

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BEYOND THE LONDON-FRANKFURT DICHOTOMY. WHAT SPACE FOR THE OTHER EUROPEAN FINANCIAL CENTERS?

Why so many banks have places rather than functions in their names and why their executive offices are often located in a different place from that implied by their name? [Cf. Kindleberger 1974, p. 2]

1. INTRODUCTION

Financial activities are those which, directly or indirectly, allow the transfer of funds needed in order to make payments or to allow savers to supply resources to investors. Financial Centers (FCs) are places where several of these activities take place. FCs are therefore not just, nor necessarily *markets* in the most strict sense, but also locations where financial intermediaries elaborate their strategies, offer their services, develop and sell new products, where information is produced and interpreted.

Financial activity concentrates in one or very few centers in each area. This justifies a widespread concern about the future of the existing national FCs, facing the increasing competition originated by the economic and technological integration of the financial world. There is evidence that financial activity permits higher economic growth¹. The worry is that, if national FCs disappear, local firms and households might end up having more, rather than less, difficulties in financing.

The integration process, however, also offers new opportunities, because each FC can now access and serve other FCs' markets, and because integration is expected to increase efficiency and foster total financial activity. It is not clear yet how much centralizing forces will prevail over rising opportunities. There will certainly be losers and winners though, and this explains why many EU governments have been taking actions to defend their FC.

The paper analyzes the mechanisms that explain the difficulties national FCs are facing and discusses which policy they should undertake. The focus is on four key elements: exogenous and dimensional factors, government policy and information; they are discussed in general terms in the rest of this section and then, more in detail, in sections 2, 3 and 4. Section 2 describes the interaction of exogenous and dimensional factors in a simple firm location model, stressing the relevance of size in determining location choices. Section 3 discusses which directions a policy aimed at guaranteeing the survival

and development of a national FC should take. Section 4 discusses information, and how the role it plays in finance opposes centralization. Section 5 reviews the theoretical and normative conclusions of the paper; national FCs must, above all, strengthen their position on the local market, valorizing the peculiarities of their own economic environment and trying to act at the same time as the main gate to the internal financial system (for the rest of the world) and as the main gate to the world financial market (for the local community).

In his classical study of FCs, Kindleberger [1974] gives evidence of how financial activity tends to cluster in very few centers, often just one, in each area. He notices that, mostly, FCs originate to centralize payments. Once one starts rising, growth by itself stabilizes and strengthens its position. Crowding, market segmentation, other FCs development strategies, can justify the existence of more than one FC, but the number will always be extremely limited. When several areas integrate, most centers will start declining with very few being able to survive and one tending to prevail².

The economic theory and several comparative and case studies have shown that both centripetal and centrifugal forces are in place, originating from four groups of factors: exogenous factors, endogenous (dimensional) factors, FCs' development policies and information, the main element that may obstruct the complete integration of the financial world.

The first group consists of absolute and comparative advantages. Heckscher-Ohlin theorem shows that, if production factors do not move while goods can be traded, countries will specialize in the goods more intensive in the production factors (labor, capital, skills,...) they have an advantage on. In general, to such type of advantages can also be reduced most *first nature* advantages, related to the exogenous characteristics of the financial place, like weather, time zone, the presence of government offices, the legal system, the *culture* of the local environment.

The second group consists of dimensional factors. The strength of a FC is in large part endogenous, depending upon market and production sizes. A bigger market makes it easier to reach the optimal production size, without having to pay for adapting and transporting the goods into other markets³. Production size is associated with scale economies: as production increases, average cost falls, increasing competitiveness.

Scale economies generate increasing returns at firm and industry levels. At firm level, they are normally due to fixed costs (sunk costs needed for establishing and the acquisition of technology and expertise), which make profitable to concentrate production in the smallest possible number of plants. At industry level, they are due to Marshallian external (agglomeration) economies: the fact that many firms of the same industry locate together generates better production conditions, reducing costs. Marshall identifies three main sources of external economies: the availability of better workforce (*pooling labor market*) and of joint facilities and intermediate goods and services, and the faster and more efficient technology transfer and learning (*technological spillovers*). Two other external economies are more specific to the financial sector, originating from the positive relationship between market size and liquidity (Kindleberger [1974], Economides [1993]), and from the crucial role that *face-to-face contacts*, requiring sociality and proximity, play in finance (Kindleberger [1974], Thrift [1994], [1996]).

There is evidence that dimensional factors are currently playing a much bigger role than exogenous factors in determining the location of financial activity.

Abraham et al. [1993] identify 47 factors on which a FC competitiveness relies, of which the 20 most important positively depend on the size of the FC or of the surrounding economy. Small FCs could benefit from lower operation costs, but these do not appear crucial for financial operators, not being even clear whether they are really higher rather than lower in the main centers. Moreover, many factors that do not depend on size, like regulation, secrecy, fiscal regime, do not refer to exogenous characteristics, but are rather *policy* elements, crucial for off-shore centers, much less important for national FCs, which cannot rely on free riding⁴.

The key role size plays is also shown by the fact that banks and *exchanges* are subjects of a huge number of mergers and acquisitions, small financial intermediaries tend to disappear, a *hub* model of industrial organization is emerging, in which the headquarters of the world-scale financial corporations, located in the main international FCs, elaborate corporate strategies and new products, with local affiliated having a mostly retail-oriented function.

Further evidence also comes from studies of banks' branching and Foreign Direct Investment (FDI) decisions, which identify local banking opportunities and the need to follow customers abroad as the main determinants. The first⁵ directly relates to dimensional factors and agglomeration: GDP, size of the employment in the financial

sector, stock market turnover, number of banks in the destination country, are identified as important sources of attractiveness⁶.

Section 2 (dimension) and the two appendices discuss the relative role of exogenous and dimensional factors, stressing the relevance of dimensional factors in fostering the concentration of financial activity. I develop a *core-periphery model* in which firm location choices are determined by the degree of market segmentation and by the interaction of exogenous advantages, market size and increasing returns, internal and external (agglomeration effects). When markets are segmented, production takes place in both center and periphery. As market integration rises, scale economies become important, and production concentrates in the central location, which offers a bigger market. If the periphery benefits of exogenous advantages, these will end up prevailing when integration further raises, production shifting towards the location which allows to benefit from both exogenous advantages and scale economies. Agglomeration economies, however, induce each firm to remain where other firms are yet; with no expectations that others will move, the periphery will prevail only if it offers very substantial advantages. Moreover, strong enough agglomeration economies may induce multiplicity of equilibria, path dependence and Pareto inefficiency; firms may continue locating in the center even when markets are perfectly integrated, and the equilibrium may be subject to self-fulfilling changes in the state of expectations.

Policy is the third element that helps explaining the existence and evolution of FCs. A FC can improve efficiency guaranteeing low taxes and commissions, light regulation, good infrastructures and investing in new technologies. However, this is not enough when competitiveness builds on the FC dimension itself and self-fulfilling expectation equilibria are possible. Virtuous or vicious circles can build, and a more elaborate policy is needed.

Section 3 (policy) restates the conclusions of the model in terms of the literature on network externalities (Katz and Shapiro [1995]), which allows to look at FCs as *systems* in competition, rather than mere byproducts of firms' location choices, and to focus on which strategies national FCs should undertake. As said, improving efficiency is not enough: the FC must also make sure it reaches and maintains the critical mass that allows external economies to operate; this may require both subsidizing potential settlers (Rauch [1993]) and guaranteeing the *reputation* of the FC making a credible commitment to its

development. Furthermore, *system compatibility decisions* become critical, as compatibility increases market size, allows specialization, increases the variety of goods and services offered through a system; this means for a FC to try establishing networks, a strategy already used extensively among *exchanges*. Finally, because market segmentation sustains multiple networks, a FC should also take advantage of the limits of the integration process, valorizing those characteristics of the local environment and of the financial activity that reward decentralization. These mostly relate to the information contents of the financial activity.

Information is the subject of section 4. Information plays a crucial role in finance, and is particularly valuable because conditions of asymmetric information are pervasive, and agents need to receive and process information in detail, timely and correctly.

Such characteristic of the financial activity may play both in favor and against centralization. On one side, making sociality and proximity more valuable, it plays as an external economy, fostering agglomeration. On the other side, making more relevant the peculiarities of the local environment (economic structure, firms', savers' and consumers' habits), it segments the markets, acting as a decentralizing factor. Foreign agents may have difficulties in exploiting the opportunities offered by the local market and may need to build "local accesses" to be competitive (Gehrig [1998a]). On this regard, national FCs can reduce informational asymmetry, which translates in availability of funds at cheaper rates and regardless of the international economic conjuncture. The same argument applies that holds for banking institutions⁷; indeed, there is evidence that financial institutions are aware of the risk that the present wave of mergers and acquisitions translates in the loss of key information⁸.

2. DIMENSION

In this section, I develop a very stylized model in the spirit of the *new economic geography* (Krugman [1991]), showing how exogenous and dimensional factors interact⁹. It is a *core-periphery* model, in which the location of financial activity is determined by exogenous cost advantages, size of the markets, internal and external economies. I discuss how location choices change facing the increasing integration of the markets, represented by falling transportation costs. I show that market integration may cause firms permanently renounce producing in the periphery, and that agglomeration

economies may induce multiplicity of equilibria and path dependence. Moreover, the equilibrium may be Pareto inefficient, leaving room for policy intervention, and subject to self-fulfilling changes in the state of expectations.

Sect. 2.1 analyses firm choices in presence of internal (scale) economies, marginal cost advantages in favor of the peripheral location and market size advantages in the central location. Sec. 2.2 adds external (agglomeration) economies, which originates equilibrium multiplicity and path dependence. To better focus on the mechanisms that determine location without complicating the algebra, quantities are assumed to be given. The two appendices extend the results to the more realistic cases of monopoly (app. 1) and imperfect competition (app. 2).

2.1 Location choices in presence of differences in costs and market size, with increasing return to scale

Consider a single-firm single-product location choice. Assume that:

- (i) The good can be produced in Center (C), in Periphery (P), or in both.
- (ii) Markets in C and P are separated. Unitary transportation cost is t , equal in the two directions.
- (iii) Fixed costs are f , equal in C and P.
- (iv) Marginal costs, c_C and c_P , are constant, being lower in P: $c_C = c_P + \Delta c$, with $\Delta c > 0$.
- (v) The quantity demanded in each market, s_C and s_P , is given, being greater in C: $s_C = s_P + \Delta s$, with $\Delta s > 0$.
- (vi) The fixed costs and the center's market size advantage are "high enough":

$$[1] \quad f > s_P \Delta c,$$

$$[2] \quad \Delta s > \frac{s_P \cdot \Delta c}{f - s_P \cdot \Delta c} (s_P + s_C).$$

	Center C	Periphery P
Demand	s_C	s_P
Fixed costs	f	f
Variable costs	c_C	c_P
Transportation costs	t	

The firm minimizes total costs, CT. There are three possibilities:

- 1) Production in both P and C: $CT_1 = s_C \cdot c_C + s_P \cdot c_P + 2f$;
- 2) Production only in C : $CT_2 = (s_C + s_P) \cdot c_C + s_P \cdot t + f$;
- 3) Production only in P: $CT_3 = (s_C + s_P) \cdot c_P + s_C \cdot t + f$.

Rewriting total costs in terms of $s_p, c_p, \Delta s, \Delta c, f, t$:

$$CT_1 = \Delta s \cdot \Delta c + s_p \cdot \Delta c + f + M ;$$

$$CT_2 = \Delta s \cdot \Delta c + 2s_p \cdot \Delta c + s_p \cdot t + M ;$$

$$CT_3 = s_p \cdot t + \Delta s \cdot t + M ;$$

where $M \equiv 2s_p \cdot c_p + \Delta s \cdot c_p + f$.

Which location is chosen, depending on transportation costs?

Consider $t \rightarrow \infty$. CT_1 not depending on t , the firm must produce in both C and P.

Consider $t=0$. The minimum total cost is $CT_3=M$ and the firm chooses to take advantage of the lower marginal costs in P.

This could suggest that, as the degree of market integration increases, i. e. as t falls, the firm just shifts from option 1 to option 3. This is not the case however: for a certain interval, production takes place in C (option 2):

- $t > A$: production takes place in both C and P;
- $A > t > B$: production takes place in C;
- $B > t$: production takes place in P;

where:

$$[3] A = \frac{f}{s_p} - \Delta c ,$$

$$[4] B = \frac{(s_C + s_P) \cdot \Delta c}{\Delta s} .$$

Assumption (vi) requires fixed costs and the difference in market size to be high enough to make A positive and greater than B, so that production does not shift directly to P. Furthermore, B is positive, which guarantees that, for a low enough t , production shifts to P¹⁰.

In conclusion, when markets are completely separated, production takes place in all locations. As the degree of market integration rises, scale economies become important and production tends to concentrate. If fixed costs and the difference in market size are high enough, at the beginning the location chosen is the center, where the demand is

greater. Only when the degree of market integration is higher, both scale economies and cost advantages affect the choice, and production takes place in the periphery.

2.2 External economies, equilibrium multiplicity and path dependence

In the previous model, the marginal cost advantage of the peripheral location emerges without ambiguity when transportation costs fall enough. The model, however, does not consider the effect of the external economy that the agglomeration of several firms may generate. To take it into account, add the following assumption (vii), and modify the previous (iii) and (vi):

(vii) There are N firms, each facing the location problem described in section 2.1¹¹.

(iii¹) Define n_C (n_P) the proportion of firms located in C (P). When a firm locates in C (P), it pays fixed costs lower than f by an amount kn_C (kn_P). k represents the effect of external economies, being $k < f$. Notice that n_C and n_P belongs to $[0,1]$; however $1 \leq n_C + n_P \leq 2$, as a firm may contemporaneously locate in C and P.

(v¹) As before, fixed costs and the center market size advantage are “high enough”:

$$[5] \quad f > s_P \Delta c + k,$$

$$[6] \quad \Delta s > \frac{s_P \Delta c \cdot (s_P + s_C) + s_P k}{f - s_P \cdot \Delta c - k}.$$

Total costs will be:

$$CT_1 = \Delta s \cdot \Delta c + s_P \cdot \Delta c + f + M - kn_C - kn_P;$$

$$CT_2 = \Delta s \cdot \Delta c + 2s_P \cdot \Delta c + s_P \cdot t + M - kn_C;$$

$$CT_3 = s_P \cdot t + \Delta s \cdot t + M - kn_P.$$

Therefore:

$t > A_1$: production takes place in both C and P;

$A_1 > t > B_1$: production takes place in C;

$B_1 > t$: production takes place in P;

where:

$$[7] \quad A_1 = \frac{f - kn_P}{s_P} - \Delta c = A - \frac{kn_P}{s_P},$$

$$[8] \quad B_1 = \frac{(s_C + s_P) \cdot \Delta c + k(n_P - n_C)}{\Delta s} = B + \frac{k(n_P - n_C)}{\Delta s}.$$

As before, condition (v¹) guarantees¹² that $A_1 > 0$ and $A_1 > B_1$.

Again, when transportation costs are high, production takes place in both C and P, so that $n_P=n_C=1$. As market integration rises, production shifts toward C and then, when the marginal cost argument prevails, to P. Now, however, B_1 depends on both n_P and n_C , not being guaranteed that it will be positive. This: a) opens the door to multiple equilibria; b) can make it impossible for P to prevail, even in case of complete market integration.

a) Consider that $B-k/\Delta s \leq B_1 \leq B+k/\Delta s$:

-For transportation costs $A_1 > t > B+k/\Delta s$ all firms choose C; $n_P=0, n_C=1$.

-For transportation costs $t < B-k/\Delta s$ all firms choose P; $n_P=1, n_C=0$.

-For¹³ transportation costs $B-k/\Delta s < t < B+k/\Delta s$:

*if all firms but one are in C, the last one chooses C too; $[n_P=0, n_C=1]$ is an equilibrium;

*if all firms but one are in P, the last one chooses P too; $[n_P=1, n_C=0]$ is an equilibrium.

Therefore, there is an interval $[B-k/\Delta s, B+k/\Delta s]$ where, depending on firms' expectations about other firms' choices, different results may emerge. If everybody thinks P will be chosen, such expectation will self-fulfill. Furthermore, one may think to location choices repeated in time, in which firms expect that, if sustainable, the past equilibrium will prevail. This suggests that, as transportation costs fall, all firms will tend to remain in C until transportation costs fall below the lower bound $B-k/\Delta s$. If everybody thinks C will continue prevailing, production switches to P only when market integration is high enough to compensate for the advantage the center receives from the external economies.

b) Moreover, if agglomeration advantages are high enough, it may be that $B-k/\Delta s < 0$. In this case, production continues taking place in C, even if transportation costs are zero. This happens for:

$$[9] \quad k > \Delta c \cdot (s_C + s_P).$$

When external economies more than compensate for the cost saving of choosing P (*being the only one*), C prevails even if markets completely integrate, $t=0$. This in spite that in P firms could benefit of both lower marginal costs and agglomeration, *if everybody localized there*. P is a Pareto superior equilibrium, but the coordination failure brings in a sub-optimal result. In this situation credibility becomes a crucial factor to shift equilibrium, and a key element of a possible strategy for a peripheral FC (cf. sect. 3).

The conclusions of the two models can be summarized as follows¹⁴:

a) When markets are not integrated, transportation costs being too high, production is decentralized, taking place in both the center and the periphery.

b) As the degree of market integration rises, scale economies become important and production concentrates in one place.

c) If markets are still partly segmented and scale economies are important, the central location prevails. This is the location that offers a bigger market, rather than lower production costs.

d) Exogenous cost advantages end up prevailing when market integration further rises. Production remains concentrated, but now it takes place in the periphery, where firms exploit both lower variable costs and scale economies.

e) Agglomeration economies, however, induce each firm to remain in the center if the other firms are there. With no expectations that others will move, the periphery will prevail only if it offers very substantial advantages.

f) Instead, if agglomeration economies are strong enough, firms can continue choosing center even if markets are perfectly integrated. There is market failure, in that firms are not able to exploit the lower variable costs of the peripheral location, ending up in a sub-optimal equilibrium.

Better production conditions of exogenous nature are not a guarantee for peripheral locations when dimensional factors are important. At the beginning of the integration process, the periphery becomes weaker because production concentrates where markets are bigger. Afterwards, periphery still has to offset the effect of agglomeration economies before to start again attracting firms, not being necessarily true that ultimately it will be able to prevail.

This explains how dramatically worldwide market integration increases competition among FCs, dimensional factors playing a crucial role and peripheral locations do not even benefiting from clear exogenous advantages. Integration does not necessarily crowd out peripheral locations, because it makes possible for firms that locate there to benefit of both lower costs (if present), and the ability to sell on the entire market. However, peripheral locations must compensate for their handicap of size, the presence of agglomeration economies requiring explicit policies aimed at influencing potential settlers' expectations.

3 POLICY

The new economic geography approach mostly looks at location from the point of view of firm choices. However, FCs can be viewed as systems by themselves, each competing with the others. The section adopts this perspective, discussing the previous conclusions in terms of the modern literature on *network externalities*. This approach focuses on policy issues, so that the change of perspective also allows to shift emphasis from the positive to the normative side, to stress different aspects of the previous conclusions and to add new ones.

The literature on *network externalities* (Katz e Shapiro [1995], Economides [1996]) analyzes the choice between different alternative technologies, and notices that it may be affected by the external effect due to the fact that the greater the number of people belonging to a network, the greater the benefit for each of them. When network externalities are present, the most commonly used system becomes the most convenient and “*tipping*” arises, the tendency of a system to prevail once it conquers an initial edge. As in the previous section, the bottom line is that external economies induce agglomeration, firms locating where others are yet, or adopting the same technology. As before, both multiplicity of equilibria and market failure, the inability of the market mechanism to select the best equilibrium, arises: which technology is selected depends on people expectations, and once one is adopted, the system may be *locked-in*, even if a better technology is, or becomes, available.

In finance, the network externality approach has been mostly used to analyze competition between stock exchanges, and between on-line and physically-located trading systems¹⁵. Di Noia [1998] notices that the use of the network externality perspective in trade is justified, because financial markets are nowadays true businesses by their own, not anymore legal monopolies, regulated because of the public good nature of trading services. However, the increasing competition among FCs involves all dimension of financial activity, trade being only the sphere in which it is more evident. The FC itself becomes a system competing with others, that produces goods and services that it offers to an increasingly integrated world market, that is subject to network externalities and that faces strategic choices concerning price policy, investments, product differentiation, integration, compatibility. As such, FCs may even acquire institutional representation by their own, as in the case of German “*Finanzplatz*”

Deutschland”, French “*Paris Europlace*” and Italian “*Comitato Per Lo Sviluppo Della Piazza Finanziaria*”¹⁶.

The network externality approach suggests that FCs should focus their effort in several directions: not only they must guarantee efficiency, but also the reaching and maintaining of a critical mass; moreover, they should try to build a network with other FCs, as well as exploiting local differences that maintain segmented the financial market.

The traditional tool for competing, *efficiency* (price, regulation, infrastructures, technology) is only part of the story. As before, offering better conditions helps, because it translates in lower variable costs for firms settling in the FC. On this respect, it is an important pre-requisite, and lower size FCs should try to offer greater efficiency. However, it is not enough by itself, due to the agglomeration - network externality effect. Other tools need to be taken into account for the FC development.

A second set of tools must focus on reaching and maintaining a critical mass.

This is particularly crucial at the very beginning. Network externality literature stresses that *competition is especially intense in the early stage of the integration*, when there are no winners and losers, yet: at this stage losers will not survive, so the outcome is dramatic, while the winners are rewarded with monopoly profits and market shares.

The need to maintain or reach a critical mass can be such that “*dramatic penetration pricing may emerge as the equilibrium outcome*”¹⁷. It may therefore be justified for FCs to subsidize settlers until reaching a size large enough for external economies to start working properly.

Furthermore, as self-fulfilling expectations on the future development of a system play a crucial role, *credibility* becomes critical. It follows that incentive mechanisms, making clear the commitment to the development of the FC, must be built. This means, for example, heavy investment in the FC infrastructures; or creating FC ownership structures which do not only attract firms, but also involve them in the development of the center; or, also, offering settlers some type of “insurance” to protect their fixed cost investment.

The third set of tools concerns compatibility choices: “*compatibility expands the size of each network to the total membership of both*”¹⁸. Market size increases therefore, which makes it possible to better exploit scale economies, reducing costs. Furthermore, compatibility expands the number of services a system offers, adding those provided by other compatible systems. In this sense, a national FC may benefit from networking with others, which allows to offer services on a bigger scale, playing as the main gate to the

internal financial system, and, at the same time, to offer more services to local customers, allowing them to access the global financial market. Gehrig [1998a], Choi et al. [1986], Jeger et al. [1992] document a “tendency towards increasing interconnectedness across FCs”, measured by the number y_{ij} of banks headquartered in city i that maintain a branch in j . *Markets* also are very active in pursuing such type of strategy, which translates in the development of common platforms, in offering trade through others markets, in building new segments of the market. The Euro area, for example, has seen in the last two years the creation of the EUROMtS and the EUREX platforms on government bonds and derivatives, the creation of the EURO.Nm (for new technology listing) and, more recently, the creation of two main stock exchange networks, Euronext (Paris, Brussels and Amsterdam) and iX (London and Frankfurt).

Another point that the network externality literature stresses is that “*Consumer heterogeneity and product differentiation tend to limit tipping and sustain multiple network*”¹⁹. When product differentiation is valuable, the argument in favor of developing compatibility with other FCs strengthens. Indeed, compatibility may allow specialization in niches with specific technology and expertise. Sharing the market, each FC can choose some product on which to focus its competitive effort, the overall size of the market justifying larger investments in a particular type of activity²⁰.

The fact that consumer heterogeneity and product differentiation obstruct centralization also suggests a fourth tool for FC development policy: exploiting the limits to market integration. In the previous section market segmentation was introduced assuming transportation costs, t . Indeed, they were not physical costs, but rather costs needed to offer the same service in different environments. These costs may be substantial in finance, because many financial relationships require timely and detailed information, as well as the ability to correctly elaborate it. Not necessarily this may be done at reasonable cost in different locations than where information comes from. To a certain extent, different for each product, the financial world continues to be segmented, in spite of globalization. The limits to the integration process originated by the informational contents of financial activity, are the subject of next section.

4 INFORMATION

The speed of technological change originated the idea that the concept itself of financial *center* is becoming obsolete. This view argues that many financial assets are “dematerialized”, and traded through computer networks which may be accessed from anywhere at low cost. Similarly, firms may structure like networks, operating through offices located far away, but steadily connected, each other. Furthermore, information becomes cheap, timely and available globally. In such conditions, firm operativeness may not be affected by location choices anymore, which may rather be determined by cost factors, or living standards. It may be the “*end of geography*” (O’Brien [1992]).

O'Brien position however holds when only general and *straightforward* information, like market price, is needed. Indeed in finance asymmetric information is pervasive, and most often complex information, costly to secure and elaborate, is needed in order to reduce the cost of moral hazard and adverse selection. Each firm in the financial sector must secure at least as good information as competitors, and even short delays can translate in big losses. Then, locating as close as possible to where information is produced and processed, financial firms can improve their competitiveness.

Most relevant information generates within the economic environment it refers to, or within FCs.

Within FCs, operators can benefit from talk, *face-to-face* contacts, informational spillovers, that allow improving the quality and correctly interpreting complex information. On this respect, when information is not straightforward, real FCs offer greater agglomeration benefits than virtual FCs, and geographic location continues to be important²¹.

However, “*geographical distribution of real activity across space also implies that information about real activity, production, tastes, and policy is generated locally across space*”²². Within the local economy relevant information generates, and may be better understood, which makes easier to assess the profitability of an asset, the reliability of a creditor, the characteristics and needs of local operators. Furthermore, competition makes *differences* in the available information more relevant; entering the local market may offer a substantial advantage from this point of view.

Retail banking is the typical case where presence in the local markets continue to be important, with major banks trying to make profits of already established endowments of information and relationships, which means entering new markets through mergers or acquisitions of local banks, to whom a certain degree of autonomy is left²³.

Local information also offers an obvious justification for investors' home bias: when prices are not enough to assess future returns, agents invest disproportionately in their local market, exploiting information advantages. At the same time, their portfolio of foreign assets overreacts to information generated locally in the foreign markets, which they have difficulties to interpret in depth.

Informational requirements make therefore valuable local information, which may induce the simultaneous presence of financial activity in both the main FCs and the national centers.

Gehrig [1998a] formalizes this concept in a model where risk-averse centrally-located investors receive noisy signals about the profitability of a risky asset. Each investors receive a signal s_i that is the sum of three components: a fundamental factor f , a local factor l , and an idiosyncratic observation error ε_i . Investors can improve the quality of their information communicating each other, which costs t per communication link and reduces the noise due to the idiosyncratic component, and/or "building a local access", which costs T and allows to observe the true value of the local factor l . Investors choose the optimal number of signals to secure, and whether to build a local access, facing a trade-off between precision and costs.

When greater precision is required, a local access is build. Moreover, when communication costs fall, the optimally-determined precision may increase or decrease; in the first case communication costs and precision of the *local* information may behave as *complements*, which means that a lower t increases local access. This is the case of foreign stock portfolios, as seen above: better generally available information increases investment in local markets, but, at the same time, it also increases the sensitivity to local information.

In sum: *"To the extent that information is localized and market access is costly, financial centres perform an important role in aggregating local information. Therefore a reduction of global market access and information costs may increase global demand for local securities, and even strengthen the role of certain financial centres"* (Gehrig [1998a]).

Financial activities can therefore be classified according to their sensitivity to information.

The most standardized, which only require straightforward information, easy to secure and process, are the natural candidate for de-location; it is the case for example of payment systems, currency trading, back office activities.

The activities likely to be centralized in the most important FCs are characterized by a more complex information structure instead, that requires relationships and expertise which lie and develop within the FC itself; it may be the case of product innovation, blue chips listing, derivatives, management buy-outs, investment banking for large customers.

A third group of financial activities crucially rely on local information, which requires financial operators to build “local access”; it is the case of retail banking or household financing, but also of small and medium size firms listing and investment banking.

Clearly, a national FC can find better opportunities focusing on the last type of activity, where local information produces an important advantage, rather than trying to avoid the moving of the first two types to electronic platform or to the main FCs respectively, which would be extremely difficult and costly.

A national FC should therefore *specialize*, strengthening its links with the surrounding economy. This means offering products and services tailored as much as possible on the specific needs of local agents, making of the FC the natural place where national operators establish their financial relationships and international operators enter the local financial market.

However, to satisfy the needs of the local economy, the FC should also pursue the goal of *diversification*. Indeed, firms and consumers require increasingly sophisticated and diversified instruments and services, which is impossible for a national FC to supply all. The solution to this apparent conflict between specialization and diversification is the establishing of networks with other FCs, which, as seen in the previous section, allows a national FC to offer at the same time to a wide range of international operators access to the internal financial market, and to national operators access to products and services offered on the international capital markets.

5 CONCLUSIONS

The economic and technological integration of the financial world dramatically increases competition among FCs. The survival itself of national FCs is endangered, because external economies foster agglomeration, inducing the financial business to

move toward the main centers. Countries risk losing not only the jobs and value added the financial sector produces, but also the benefits that the presence of a FC tailored on the characteristics and needs of the local economy offers. These benefits derive from the better use of information, which reduces market failures and makes possible to obtain better financing conditions.

Integration however also offers FCs the opportunity to compete on a worldwide scale, which means to benefit of a much larger and more efficient market, where funds are found more easily and investment opportunities multiply. To compete, national FCs must guarantee efficiency, which means comparable costs and regulation, as well as appropriate physical and technological infrastructures.

Guaranteeing competitiveness however is not enough when external economies are in place: FCs must also guarantee the reaching and maintaining of the critical mass needed for agglomeration economies to operate. This crucially depends on credibility, so that commitment devices must be devised in order to generate positive expectations of development of the FC.

Furthermore, national FCs must find ways of conjugating *diversification*, which means offering a greater variety of products and services to customers within the area, with *specialization*, which implies focusing the competitive effort on a narrow set of products.

A way of doing so is by establishing networks with other FCs, and specializing primarily on those activities which offer the center the possibility of exploiting informational advantages. These relate to the peculiarities of the surrounding area: within the national FC the characteristics of financial instruments suited by local savers and investors are better understood, and detailed information about the state of the economy and of single firms is timely produced and more correctly interpreted. In practice, the FC must tailor its services on those mostly needed by local operators and play as main gate to the area for international operators wishing to enter the local market.

Moreover, networking with other FCs also allows to offer local operators a wider range of products and services, making possible for the FC to play as the most natural way through which national operators access the international capital markets.

REFERENCES

- Abraham J., Braves N., Guinotte A., Lacroix Y. [1993]: *The competitiveness of European financial centres*. Research monographs in banking and finance, n. M93/1, Institute of European Finance, University College of North Wales, Bangor, UK.
- Becattini G. [1987] (ed.): *Mercato e forze locali: il distretto industriale*. Il Mulino.
- Bernanke B. [1993]: *Credit in the macroeconomy*. Federal Reserve Bank of New York Quarterly Review, March.
- Buch, C. [1999]: *Why do banks go abroad? Evidence from German data*. Kiel WP 948.
- Choi S., Park D., Tschoegel A. [1996]: *Banks and the world's major financial centers, 1990*. Weltwirtschaftliches Archiv, Bd. 132.
- Consob [1998]: *Incontro annuale con il mercato finanziario*. President Tommaso Padoa-Schioppa's speech, Milan, 7 April 1998.
- Delligatti R., Tamborini R. [1998]: *Imperfect capital markets: A new macroeconomic paradigm?* Mimeo.
- Demirgüç-Kunt, A., Levine, R. [1993]: *Stock market development and financial intermediary growth*. World Bank, WPS 1159, July.
- Di Noia C. [1998]: *Competition and integration among stock exchanges in Europe: network effects, implicit mergers and remote access*. Wharton School, University of Pennsylvania, WP 98-03.
- Dixit A., Stiglitz J. [1977]: *Monopolistic competition and optimal product diversity*. American Economic Review, June, 297 Ss.
- Economides N. [1993]: *Network economics with application to finance*. Financial Markets, Institutions & Instruments, vol. 2, no. 5, 89-97.
- Economides N. [1996]: *The economics of networks*. International Journal of Industrial Organization, October.
- Ekholm K., Forslid R. [1997]: *Agglomeration in a core-periphery model with vertically- and horizontally-integrated firms*. CEPR WP 1607, March.
- Fair D., Raymond R. (eds.) [1994]: *The competitiveness of financial institutions and centers in Europe*. Kluwer, Dordrecht, NL.
- Focarelli, D., Pozzolo, A. [1999]: *Le determinanti della scelta delle banche di entrare in mercati esteri*. Rome, Bank of Italy, Mimeo.
- Galetovic A. [1996]: *Finance and growth: a synthesis and interpretation of the evidence*. BNL Quarterly Review, March, pp. 59 Ss.
- Gehrig T. [1998a]: *Cities and the geography of financial centres*. CEPR WP 1894.
- Gehrig T. [1998b]: *Competing markets*. European Economic Review, 42, 277-310.
- Goldberg M., Helsley R., Levi M. [1988]: *On the development of international financial centres*. Annals of Regional Science, February, special issue, 81-94.
- Goldberg L., Johnson D. [1990]: *The determinants of US banking activity abroad*. Journal of International Money and Finance, 9, 123-137.
- Goldberg L., Grosse R. [1994]: *Location choice of foreign banks in the United States*. Journal of Economic and Business, 46, 367-379.
- Grosse R., Goldberg L. [1991]: *Foreign bank activity in the United States: an analysis by country of origin*. Journal of Banking and Finance, 15, 1093-1112.
- Hotelling H. [1929]: *Stability in competition*. Economic Journal, 39, 41-57.
- Jeger M., Haegler U., Theiss R. [1992]: *On the attractiveness of financial centers*. In: Blattner, N., Genberg, H., Swoboda, A. (eds.): *Competitiveness in Banking*.
- Katz M., Shapiro C. [1994]: *System competition and network effects*. Journal of Economic Perspective, vol. 8, n. 2, 93-115.

- Kindleberger C. [1974]: *The formation of financial center: a study in comparative economic history*. Studies in International Finance, n. 36, Princeton University.
- King R., Levine R. [1993]: *Finance and growth: Schumpeter might be right*. Quarterly Journal of Economics, August, pp. 717 Ss.
- Krugman P., Venables A. [1990]: *Integration and the competitiveness of the peripheral industry*. In: Bliss C., Braga de Macedo J. (eds.): *Unity with diversity in the European Community*. Cambridge, Cambridge University Press.
- Krugman P. [1991a]: *Geography and trade*. MIT press.
- Krugman P. [1991b]: *Increasing returns and economic geography*. Journal of Political Economy, vol. 99, n. 3, 483 Ss.
- Krugman P. [1995a]: *Development, geography and economic theory*. MIT press.
- Krugman P. [1995b]: *Globalization and the inequality of nations*. Quarterly Journal of Economics, November, 857 Ss.
- Levine R., Zervos S. [1998]: *Stock markets, banks and economic growth*. American Economic Review, June, pp 537-559.
- Leyshon A., Thrift N. [1997]: *Money and space*. Routledge, London.
- O'Brien R. [1992]: *Global financial integration: the end of geography*. Pinter.
- Marano A. [1998]: *Le tendenze alla centralizzazione nei mercati finanziari europei. Quali spazi per i centri minori?* Milan, Istituto per la Ricerca Sociale, Quaderni, n. 17.
- Marano A. [2000]: *What Space for Regional Centers in a Worldwide Financial Market?* Presented at the International Conference on Banking, Financial Markets and the Economies of the Middle East and North Africa, organized by the Lebanese American University, Byblos, Lebanon, May 25-27, 2000.
- Ministero del Tesoro (Italy) [1999]: *Il futuro della Piazza finanziaria italiana*. February. Mimeo.
- Monfort P., Ottaviano G. [1999]: *Local labor markets, skill accumulation and regional disparities*. Mimeo.
- O'Connell T., Kennedy N. [1994]: *Dublin international financial service centre: a review*. In: Fair, Raymond (eds.) [1994].
- Rajan R., Zingales L. [1999]: *Financial dependence and growth*. Mimeo.
- Rauch J. [1993]: *Does history matters only when it matters a little? The case of city-industry location*. NBER, WP 4312.
- Reed H. C. [1981]: *The preeminence of International Financial Centers*. Praeger.
- Salop S. [1979]: *Monopolistic competition with outside goods*. Bell Journal of Economics, 10, 141-156.
- Schmutzler, A. [1999]: *The new economic geography*. Journal of Economic Survey, Vol.13, n.4, 355-379.
- Thrift N. [1994]: *On the social and cultural determinants of international financial centres: the case of the city of London*. In: Corbridge S, Thrift N, Martin R: *Money, power and space*. Oxford Blackwell.
- Thrift N. [1996]: *A phantom state? International money, electronic networks and global cities*. In: Thrift, N.: *Spatial formations*. Sage.
- Venables A. [1985]: *Trade and trade policy with imperfect competition: the case of identical products and free entry*. Journal of International Economics, 19, 1-19.
- Venables A. [1993]: *Equilibrium locations of vertically linked industries*. CEPR, WP n. 802.
- Yamori N. [1998]: *A note on the location choice of multinational banks: the case of Japanese financial institutions*. Journal of Banking and Finance, 22, 109-120.
- Walter I. [1998]: *Globalization of markets and financial-center competition*. Mimeo.

APPENDIX 1: MONOPOLY

Modify the model of section 2.2 assuming that each firm produces a different product in condition of monopoly. Costs are identical for each firm, equal to those in the text. However, now quantity is not taken as given, demand conditions being described by a traditional downward-sloping linear schedule, equal for each of the N product.

	Center C	Periphery P
Demand	$p_C = a - b \cdot q_C$	$p_P = d - b \cdot q_P$
Fixed costs	$f - kn_C$	$f - kn_P$
Variable costs	c_C	c_P
Transportation costs	t	

As before, $c_C = c_P + \Delta c$, $\Delta c > 0$, $0 < k < f$, $0 \leq n_C, n_P \leq 1$, $t \geq 0$. Moreover, a , b and d are positive, with $a > d$, which indicates that market size is greater in C.

Equating marginal revenues and costs, the profit functions in case of location in both C and P (Π_1), only in C (Π_2) and only in P (Π_3) can be written as:

$$\Pi_1 = \frac{1}{4b}(a - c_C)^2 + \frac{1}{4b}(d - c_P)^2 - 2f + k(n_C + n_P),$$

$$\Pi_2 = \begin{cases} \frac{1}{4b}(a - c_C)^2 + \frac{1}{4b}[d - (c_C + t)]^2 - f + kn_C & \text{per } t < d - c_C \\ \frac{1}{4b}(a - c_C)^2 - f + kn_C & \text{per } t \geq d - c_C \end{cases},$$

$$\Pi_3 = \begin{cases} \frac{1}{4b}[a - (c_P + t)]^2 + \frac{1}{4b}(d - c_P)^2 - f + kn_P & \text{per } t < a - c_P \\ \frac{1}{4b}(d - c_P)^2 - f + kn_P & \text{per } t \geq a - c_P \end{cases}.$$

The following conditions guarantee that there is an equilibrium with positive production and non-negative profits in all three cases:

$$[A.1.1] \quad d > c_C,$$

$$[A.1.2] \quad f < \frac{(d - c_P)^2}{4b} + kn_P.$$

Comparing Π_1 , Π_2 and Π_3 one finds that:

$$\begin{aligned} t > A_2: & \quad \text{production takes place in both C and P,} \\ A_2 > t > B_2: & \quad \text{production takes place in C,} \\ B_2 > t & \quad \text{production takes place in P,} \end{aligned}$$

where:

$$[A.1.3] \quad A_2 = d - c_C - \sqrt{(d - c_P)^2 - 4b(f - kn_P)},$$

$$[A.1.4] \quad B_2 = \frac{(a - c_C + d - c_P) \cdot \Delta c}{\Delta s + \Delta c} - k \frac{2b(n_C - n_P)}{(\Delta s + \Delta c)}.$$

The assumptions on f guarantee that the radicand in A_2 is positive. Assume further that fixed costs are high enough to make A_2 positive and greater than Δc . This happens for:

$$[A.1.5] \quad f > \frac{d - c_C}{b} \Delta c + kn_P;$$

The bottom limit for f in [A.1.5] is lower than the upper limit determined by [A.1.2]. Therefore, there is an interval for f where fixed costs are low enough to guarantee non-negative profits and high enough to make production taking place in only one place.

As before, when the difference in market size, $\Delta s = a - d$, is high enough, $A_2 > B_2$:

$$[A.1.6] \quad \Delta s > \frac{\Delta c \left[(d - c_p) + \sqrt{(d - c_p)^2 - 4b(f - kn_p)} \right] - 2kb(n_c - n_p)}{A^2 - \Delta c},$$

where the denominator is positive thanks to [A.1.5].

When external economies are not present, B_2 does not depend on n_p and n_c and there is a critical value for transportation costs, univocally determined, below which all firms switch from C to P. Furthermore, $B_2 > 0$, so that for $t \rightarrow 0$ production ends up in P with certainty.

When external economies are present, instead, B_2 depends on n_p and n_c , so that in a certain interval, as transportation costs fall, there is equilibrium multiplicity. Furthermore, it may be that $B_2 < 0$, which makes it impossible for the periphery to prevail even when markets completely integrate, producing a Pareto inefficient equilibrium where production remains in the center forever. Substituting $n_p = 0$ and $n_c = 1$ in B_2 this happens when external economies are strong, i. e.:

$$[A.1.7] \quad k > \frac{\Delta c}{2b}(a + d - c_c - c_p).$$

An example where this happens can be built easily substituting the following values: $k=2, f=4, b=0,5, \Delta s=10, \Delta c=0,1, d-c_p=4, a>14$.

APPENDIX 2: IMPERFECT COMPETITION

Most of the results of section 2.2 can be replicated in case of imperfect competition. To do it, I introduce agglomeration economies in the core-periphery model by Krugman and Venables [1990] (KV), and examine how the function that describes the difference between firm profits in C and P depends on transportation costs.

KV examines a situation of monopolistic competition: there are N_c firms in C and N_p in P, each producing its own variety of a differentiated product. All goods produced in a location are symmetric, so that it is possible to consider one firm located in C and one located in P only. Given the inverse demand curve, firms compete as Cournot competitors in each market. The number of firms in C and P is endogenized by imposing a long run equilibrium with zero-profits. Internal economies are introduced through fixed costs, and firm choices are analyzed when transportation costs fall.

With respect to KV, I assume that products are homogenous (as in Venables [1985]), and that the periphery benefits from lower (constant) marginal costs, a case KV examine only at a second stage. Furthermore, I introduce agglomeration economies, assuming fixed costs ($f - kN_c$) and ($f - kN_p$) for C and P respectively, with $k < \max(f/N_c, f/N_p)$.

In this case, the equation describing the difference between profits made by firms in P and C (eq. [10] in KV) may be written as follows:

$$[A.2.1] \quad (1 + N_p + N_c) \cdot (\Pi_p - \Pi_c) = R - 2S \cdot t + V \cdot t^2,$$

where :

$$R = (s_c + s_p) \cdot \Delta c \cdot \left[(a - c_p) + (a - c_c) + \Delta c \cdot (N_c - N_p) \right] - k \cdot (N_c - N_p) \cdot (1 + N_c + N_p),$$

$$S = s_p \cdot \Delta c + \Delta s \cdot (a - c_p) + \Delta s \cdot \Delta c \cdot (N_c - N_p),$$

$$V = (s_c + s_p) \cdot (N_c - N_p) + \Delta s.$$

s_C and s_P are parameters measuring market size, being $s_C - s_P \equiv \Delta s > 0$. As before, marginal costs are c_C and c_P , with $c_C - c_P \equiv \Delta c > 0$. Also, $a > c_C$ and transportation costs, t , are positive.

The equilibrium number of firms in each location is endogenously determined by the zero-profits condition. However, the number of firms in each location cannot be negative: if the difference [A.2.1] is negative, the number of firms in C must fall to 0 and vice versa.

Consider first $t=0$ and $k=0$. It will be:

$$(\Pi_P - \Pi_C) \propto (a - c_P) + (a - c_C) + \Delta c \cdot (N_C - N_P).$$

The first two terms on the RHS are positive. Consider the third: if $N_C > N_P$, the profit difference is positive, i. e. firms in C will ultimately incur losses. It follows that N_C must fall and $N_C - N_P$ must become negative. This is enough to guarantee that with complete market integration at least a partial migration of production towards P will take place.

However, if $k > 0$ the situation changes. It will be:

$$(\Pi_P - \Pi_C) \propto (a - c_P) + (a - c_C) + (N_C - N_P) \cdot \left[\Delta c - \frac{(1 + N_C + N_P)}{(s_C + s_P)} \cdot \Delta c \right] \cdot k.$$

If k is high enough and $N_C > N_P$, the profit difference may be negative. In this case, in spite of complete market integration, production will concentrate in C, N_P going to 0, as in sect. 2.2 when $B_1 < 0$.

Furthermore, consider values of t and Δc low enough to make the sign of [A.2.1] be determined by the term in t , i. e. $-S$. The sign of S will depend on the 2nd term, $\Delta s(a - c_P)$, the only one that does not depend on Δc . Being $\Delta s(a - c_P) > 0$, $-S$ will be negative, and so $\Pi_1 - \Pi_2$. It follows that, if the marginal cost advantage of P is not big and transportation costs are low enough (but not zero), the number of firms located in P will fall to 0, and production will take place in C only.

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Footnotes

¹ Cf. King and Levine [1993], Demirgüç-Kunt and Levine [1993], Galetovic [1996], Levine and Zervos [1998], Rajan and Zingales [1999].

² The evidence concerning *markets* is striking. For example the number of regional exchanges in the US was more than 100 in the nineteenth century; it fell to 18 in 1940, to 7 at the end of 1980, to 5 in 1999 (Arnold et al. [1999]). At the beginning of 2000 there were 18 stock exchanges in Europe (15 of which within the EU), and 13 markets for stock/index options and futures; all are presently involved in mergers or acquisitions, and their number is going to fall considerably in the near future.

³ Kindleberger [1974] lists some of the factors increasing the size of the local financial market that appear relevant from an historical point of view: geographic centrality and with respect to transportation systems, openness to international trade, disposability of saving, the importance of the currency, the presence of big non-financial firms in the area.

⁴ The recent EU agreements on the tax package and the take over bids further narrowed the space for fiscal and regulatory competition.

⁵ The second is discussed in note 8 below.

⁶ Banks' branching decisions are analysed in Choi et al. [1996], Jeger et al. [1992]. Goldberg et al. [1989] and Goldberg and Grosse [1994] study the FDI decisions of foreign banks in the US. Goldberg and Johanson [1990] and Yamori, [1999] deal with the FDI of US and Japanese banks respectively. Focarelli and Pozzolo [1999] analyze the FDI of banks belonging to the OECD during the 1990s; they also find that a high cost revenue ratio in the destination country is attracting, rather than disincentivating, investment, banks interpreting it as signalling the possibility of efficiency gains.

⁷ On the role of asymmetric information in the banking industry and the relevance of long-run relationships between banks and firms cf. Diamond [1984], Bernanke [1993], Delligatti and Tamborini [1998].

⁸ Focarelli and Pozzolo [1999] notice that banks prefer to enter foreign markets through filiations rather than branching, the first allowing to make use of an already developed set of information. The same argument is used by Nardozi [1999] to explain the "*federative*" model of merger and acquisition adopted in Italy, leaving substantial autonomy to local banks. Also, when banks do FDI to follow their customers abroad, as shown by the significance of the "bilateral trade" and "manufacturing sector FDI" coefficients, they show that the building of a relationship with customers is costly; banks are even willing to pay the price of lower return in the foreign market, not to risk their national customers switching to a bank that has branched abroad (Focarelli and Pozzolo [1999], Buch [1999]).

⁹ FC location can be studied borrowing several alternative theoretical approaches, none of which, however, has been thought for, or extensively applied to, financial markets. Apart from Krugman's *new economic geography*, the literature on *product differentiation* could be used (Hotelling [1929], Salop [1979] as well as that on *network externalities* (Katz and Shapiro [1994], Economides [1996] and on *industrial districts* (Becattini [1987])). All these approaches use different languages to stress very similar mechanisms, and stress the importance of dimensional factors. Among the applications to the study of FCs are Gehrig [1998b], which applies Salop's model of spatial competition to competing financial centers; Economides [1993] and Di Noia [1998], which apply the network externality approach to competition between trading platforms. In section 3, this last approach will be used to discuss FC location from a policy-oriented point of view.

¹⁰ [1] and [2] are necessary and sufficient to guarantee $A > B$. If f was so small that the unitary cost advantage of concentrating production in C, f/s_P , was lower than the greater unitary cost, Δc , it would be $B > 0 > A$: it would be efficient producing in both locations till transportation costs fall enough to justify concentrating production directly in P, exploiting both the (in this case small) saving on fixed cost and the advantage of P in terms of lower marginal costs (cf. eq. [1]). If (cf. eq. [2]) Δs was very small instead, producing in C would not offer a substantial saving on transportation costs with respect to P; only variable costs would matter, it would be $B > A$ and again production would shift directly to P.

¹¹ In app. 1 prices and quantities are endogenized assuming each firm produces its own financial product in condition of monopoly. App. 2 analyzes the case of imperfect competition. As always, there is a trade-off between completeness and simplicity. The main conclusions remain unaffected, though.

¹² Being now only sufficient.

¹³ Approximating $(N_P-1)/N$ and $(N_C-1)/N$ with n_P and n_C .

¹⁴ They are robust to several extensions. Prices and quantities are endogenized in the appendices. Introducing an advantage for P in terms of fixed costs only accelerates the switch from C to P, but does not change the bottom line. Furthermore, also the fixed costs lost relocating from C to P should be taken into account; the reduction of t will then have to be bigger for P to prevail, and lower the size of the external economy needed to make B_1 negative. The same happens adding a term L_{N_C} (L_{N_P}) to s_C (s_P), which allows to analyze the case in which agglomeration economies operate also increasing market size.

¹⁵ Economides [1993] notices that another externality may play a role in such competition: a system can free ride on the price revealing mechanism, renouncing to build its own system and using equilibrium prices emerging in other markets instead.

¹⁶ Another good example of multi-level strategy is represented by the Irish government policy for the Dublin FC, which, among other, involved fiscal dumping and the technological integration of Dublin with London (cf. O'Connell and Kennedy [1994]).

¹⁷ Katz, Shapiro [1995], p. 107.

¹⁸ *Ib.*, p. 109.

¹⁹ *Ib.* p. 106.

²⁰ *"In medium-sized international FCs the number, quality and size of the participants are often insufficient at the start to master innovative technology, to build up professional expertise, to share the financial burden of the initial investment and to secure a satisfactory rate of utilization of the new capacity in the early state of the project"* (Abraham et al [1993] p. 44).

²¹ Thrift [1994] argues that *"Indeed the volume and the speed of financial flows may make it even more imperative to construct places that act as centres of comprehension"*. He defines international FCs as consisting of three components, business organizations, markets and culture, defined as the need for information, for the expertise that allows such information to be interpreted and for the social contacts that generate trust, information, interpretive schemes. He notices that each of these components increasingly requires sociability and proximity: firms need contacts to generate and maintain their flow of business; highly volatile and speculative markets require the formation of social networks within which information can be interpreted almost immediately; increasing complexity requires concentration of the expertise for the monitoring of the system and the development, marketing, customization of innovation.

²² Gehrig [1998a], p. 20.

²³ Cf. note 8 above. This in spite that payment services are increasingly dislocated.