“The rise of international financial centres in bank-based and market-based financial systems”

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THE RISE OF INTERNATIONAL FINANCIAL CENTRES IN BANK-BASED AND MARKET-BASED FINANCIAL SYSTEMS

Abstract

International Financial Centre (IFCs) such as London or New York are one of several contributing factors toward the continued economic success of their respective countries in the twentieth century. Other countries have attempted to create their own IFCs with mixed successes. This study examines factors that might predict the appearance of IFCs and the differences in financial scale. Of particular interest is the debate between 'bank-based' versus 'capital-based' financial systems and how it impacts the growth and success of IFCs. Results suggest that bank-based systems are marginally more effective in promoting and benefitting from IFCs. Stronger financial market regulations are also positively associated with the growth of IFCs and the resulting benefits that they provide to the rest of the economy. Together, this suggests that the optimal policy mix to promote IFCs may involve some degree of government involvement beyond strictly maintaining free and fair financial markets for the private sector.

Keywords international financial centre, London, New York, Hong Kong, capital markets, stock exchange, financial systems

JEL Classification F21, G15, G28

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INTRODUCTION

Financial centres are perceived to bring good jobs, high incomes, and concentrations of capital to a country (Cassis, 2006). Cities like Hong Kong, London, New York, São Paulo, Sydney, and Tokyo (Sassen, 1991) are commonly-cited examples to emulate. This is especially true for emerging-market economies with some progress, as they shift away from the basics to the development of a financial sector and a financial centre that serves as a focal point for the industry to agglomerate (Dorrucciet et al., 2009).

The link between growth and financial development is established (Robinson, 1952; Hicks, 1969). The classical debate is between the relative merits of a 'market-based' versus a 'bank-based' system, along with the classical case study between the US and the UK (market-based) against Japan and Germany (bank-based) (Corbett & Jenkinson, 1996; Allen & Gale, 1999). The theory is that the US, and to a lesser extent the UK, have structured their financial systems towards the internal and external capital market, whereas Japan and Germany rely more heavily on an internalized banking system to redistribute funds. Financial centres were mentioned in passing perhaps because these four countries historically housed the most developed financial centres.

In business, professional publications such as the Global Financial Centres Index (GFCI) and The Banker's annual report have been in circulation for years. For example, the GFCI defines a financial centre

as "an intense concentration of a wide variety of international financial businesses and transactions in one location" (Z/Yen Group, 2005). A key word is "concentration". As explained in an earlier book Moving Money by Verdier (2002), the author credits the agglomeration of financial institutions into financial centres as one of the key factors in the proliferation of the internationalized financial industry. Another key word is "international", which the GFCI uses to differentiate between "global financial centres" and "international financial centres". They claim that London and New York are "global financial centres" because financial institutions located in those two places are mainly international in nature.

We suspect this distinction was inspired by an earlier work by Sassen (1999) where the words "global" and "international" were also used and in a similar way. The difference is that Sassen included location and degree of national consolidation as well, meaning that Tokyo was also included as a member of the "global" club as well by virtue of the economic benefits of close proximity to policymakers and to sources of financial information. In a similar vein, Cheung and Yeung (2007) analyzed Hong Kong's place in the financial centres hierarchy with respect to staving off competition from Singapore and maintaining its place as Asia's top financial centre.

This study examines the relationship between 'bank-based' and 'market-based' financial systems and the creation of new financial centres, plus the development of existing ones. We include institutional factors believed to be related to financial development. A secondary goal is to explore the concept that there might be distinct levels of financial centres such as "global" and "international".

1. LITERATURE REVIEW

Most literature on financial centres is case studies. For example, the TIME magazine popularized the term Nylonkong (Elliot, 2008) to describe those three as "the key drivers of the global economy" and the top of the financial centre world. The choice of London and New York are not surprising and the term "NY-LON axis" (Wójcik, 2014) had been in use for some time. Hong Kong was once ignored by Sassen and later dismissed as "not in the same league" (McGuire & Chan, 2000) as NY-LON, except that Hong Kong was more connected to NY-LON than Tokyo (Beaverstock et al., 2000). However, as noted later by Noble and Rabinovitch (2014), Hong Kong has since benefited from the economic rise of China as the former continues to act as a gateway for embryonic Chinese companies venturing into the global financial system.

Outside the Nylonkong, a few other financial centres have also been examined in more detail, such as Luxembourg (La Porta et al., 1998; Wintersteller, 2013), Singapore (Ngiam, 1996; Huat et al., 2004; Tan & Lim, 2007; Long & Tan, 2010), Sydney (Acuto & Steele, 2013; Bishop et al., 2013), Tokyo (Rossi, 2009; Cassis, 2010, 2011), and Toronto (Bryan, 2010; Wójcik, 2011; Posadzki, 2015).

At risk of over-simplification, a common theme is that size is not the only consideration. For instance, The Banker published rankings in 2013 in which London overtook New York for the top spot, with "international appeal rather than size" winning out (Pavoni, 2013). Another common theme is the concept of a hierarchy or network of financial centres in a given region. As Wall and Van der Knaap (2011) argue, despite the fierce competition between financial centres, especially those in a similar geographic region, there is also a degree of interdependence and cooperation similar to that of the corporate hierarchy.

Case studies can identify the 'package' of factors that led to the success of a given financial centre but are less able to isolate the effects of each factor. For example, a hypothetical study examining the success of Hong Kong and Singapore as financial centres might cite factors such as entrepôt economy, South-East Asia, coastal location, former British colony, lower tariffs, or ethnic-Chinese majority. Now consider Dubai, also an entrepôt economy in a coastal location with low tariffs but not in South-East Asia. Can Dubai become the next top financial center?

These questions are hard to answer without analyzing each factor separately, but such studies are also hard to find. Kindleberger (1974, cited in Gehrig,

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2000) initiated discussions on financial centres by analyzing their functions, particularly banking functions. As Gehrig noted, Kindleberger ignored or understated the importance of location, agglomeration, and the functions of capital markets. Porteous (1999) delved into the characteristics of financial centres in general and seek to classify core financial activities within these centres utilizing quantitative data. These include the role of multi-national corporations, bank headquarters, employment within the financial sector, and stock market volume.

With the shortage of directly-related literature, we search for the next best alternative: studies analyzing the driving factors for financial development. The assumption is that the driving factors for financial development and the growth of financial centres may be somewhat related.

1.1. Bank-based versus market-based

The crux of the bank-based or market-based debate is the difference in the way the two financial entities reallocate resources. As explained by Levine (2002), the bank-based system paradigm is "better at mobilizing savings, identifying good investments and exerting sound corporate control, particularly during the early stages of economic development and in weak institutional environments", while capital markets are "allocating capital, providing risk management tools, and mitigating the problems associated with excessively powerful banks".

As expected, there are proponents on both the bank-based (Boyd & Prescott, 1986; Bhide, 1993) and the market-based (Allen & Gale, 2000) camps, along with some in the middle-ground (Levine & Zervos, 1998; Arestis et al., 2001; Demirguc-Kunt & Levine, 2001; Beck & Levine, 2004), depending on the method used. There might even be interaction effects between country characteristics and driving factors. For example, a cross-country analysis conducted by Demirguc-Kunt et al. (2011) found that the sensitivity of bank development to economic development decreases as the economy improves, while the inverse is true for capital markets.

1.2. Legal origin

Empirical research on the link between the legal system and financial development actually came first (La Porta et al., 1998; Demirguc-Kunt & Maksimovic, 1998; Levine, 1998, 1999), while the proposed theory came later. In simple terms, financial development occurs through two central channels: "political" and "adaptable" (Beck et al., 2003). The political channel stresses that legal origin has a profound effect on private property rights and the role of the state. For civil law countries this means the role of the state is advanced at the detriment of financial development, which in turn favors a bank-based system. Market-based systems tend to be based on common law as they limit the role of the state and prize private property rights and the rights of the individual.

1.3. Regulation and supervision

Older scholars such as Stigler (1964) have argued that the optimum level of regulation is none. Given the number of systematic crises that has occurred, estimated to be over 100 since the 1970s (Barth et al., 2009), it is safe to conclude that such fundamentalist views have been discredited. The question is what regulations are important for developing a financial centre.

The importance of capital market regulations is well-documented (La Porta et al., 2006; Calvo et al., 2006; Jacobzone et al., 2010). Parker and Kirkpatrick (2012) are more specific and emphasize capital market regulations that prevent financial crisis and mitigate their damage.

Banking market regulations are another item discussed. However, this time the narrative is that banks in less-developed countries should be less-regulated so that they have more freedom to act (Bertus et al., 2007). A more comprehensive study later from Barth et al. (2013) explains that lax regulations but adequate enforcement is optimal.

The third major item we found was labor market regulations and here the views are mixed. Gordon et al. (2003) believe that labor market regulations can both help and hinder development. Djankov et al. (2006) support more strict regulations because it aids development. Busse and Groizard (2008) believe that overly-stringent labor regulations can reduce foreign investment.

2. METHODOLOGY

The sample is an unbalanced panel that spans three years from 2013 to 2015 for a total of 507 cities across 146 countries, of which 71 cities are classified as financial centres[1].

2.1. Financial centres and market-based systems

The operational definition of a financial centre is a city that contains at least one stock exchange registered with the World Federation of Exchanges (WFE)[2] for at least one year from 2013 to 2015. The WFE contains the Total Market Capitalisation (TMC) of each stock exchange for each recorded year in current-USD using the exchange rate of the last trading day of the calendar year for that exchange. We use TMC as the proxy measure for the effect of capital markets. The WFE does not explain the treatment of companies listed on multiple exchanges. See the website for more details.

To estimate factors that affect the odds of a city becoming a financial centre we need cities that are not financial centres. The sensitive decision is determining which cities without stock exchanges should be included. It does not make sense to include hundreds of thousands of small settlements in the whole world that will almost never become a financial centre in the foreseeable future. We use cities included in Oxford Economics (OE), a city-level dataset of statistics for cities with "reasonable" size and recognition. This avoids destabilizing the results by having too many zeros in the dependent variable. See the OE website for more details.

2.2. Bank-based systems

The effect of the banking industry is represented by the Total Bank Asset (TBA) statistic from Orbis Bank Focus (OBF) in current USD. The source contains the Latinized native-language names and basic financial statistics of around 20,000 banks in the world for each year. We manually searched for the city and country of the registered domicile address of each bank. The data limitation is the existence of tax-havens, such as the British Virgin Islands, where the actual headquarters or main operations is clearly located in London. We cannot account for this weakness because we are unable to systematically define a bank's "real" headquarters or "real" centre of operations. See the OBF website for more details.

2.3. Two measures for the success of financial centres

We use two variables derived from Oxford Economics. The first is the percentage of employment that is finance-related, calculated by dividing total number of workers in "financial & business services" by total employed population. This is a proxy for "good jobs".

The second is the natural log of the GDP-per-capita of the city in current USD, calculated by dividing total city GDP by total city population. This is a proxy for "high income".

2.4. Other explanatory factors

The legal origin of each city is taken from JuriGlobe (n. d.). This is a country-level variable. JuriGlobe's four[3] classifications are: "civil", "common", "customary", and "Muslim". Each country can have one, two, three, or all four systems in place. We capture legal origin using a common-law fixed-effects indicator: "1" if there is a common-law element, "0" otherwise.

The effects of regulation are represented using the Economic Freedoms of the World (EFW) indices derived by the Fraser Institute (2018). This is a country-level variable. There are five categories of indices and one of them is "regulations". We use the three sub-aggregated variables in the "regulations" category: "Credit market regulations", "Labor market regulations", and "Business regulations". There is no separate indicator for banking regulations and the closest we can find is business regulations. These indices are provided at the country-level, with scores from 0 (none) to 10 (perfect) presented up to 4 decimal places.

1 The authors have a complete list of countries and cities included in Word Document tables but was omitted from the final published version due to space constraints. Please contact via email if interested.

2 http://www.world-exchanges.org/home/index.php/statistics/annual-statistics

3 Almost: Israel is classified as "Jewish".

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We finally add a capital-city[4] indicator to capture the political and economic resources advantages they typically enjoy (Gilliland, 2013).

3. RESULTS

3.1. Summary statistics: "Global" and "International" financial centres

We are unaware of a testable definition for financial centre "tiers" that is also grounded in theory. We provide summary statistics for preliminary discussion.

The horizontal axis lists the natural log of the average Total Market Capitalization (TMC) of each city with a stock exchange for the years 2013, 2014, and 2015 according to the World Federal of Exchanges (WFE). The vertical axis takes the Total Bank Assets in current USD without inflation adjustments, according to the Orbis Bank Focus. The right-axis indicates the ratio between the TMC of the stock exchange and the GDP of the country it belongs to. See the data section for details.

There is a visible log-linear correlation between average TMC and average TBA (Figure 1). This allows us to, for simplicity, focus on TMC when evaluating financial centres, since we have already decided to define a financial centre as a city with at least one registered stock exchange with the WFE.

Besides "global" and "international", we are interested if there is a difference between "international" and what we call "regional" for exposition. We compare the percentage change between the average TMC during 2013–2015 for a city and the previous-ranked one, in ascending order. The percentage changes are illustrated in vertical bars and in sorted order from lowest to highest TMC (Figure 2). The interpretation

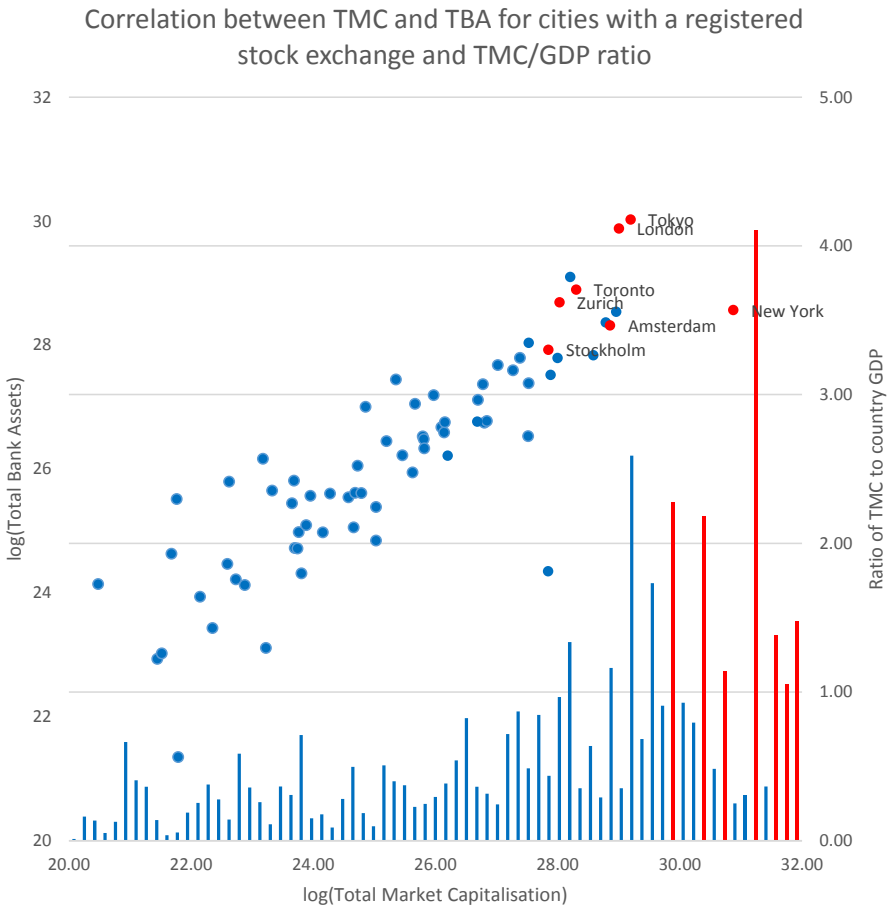

Figure 1. Average total TMC and TBA of cities with at least one registered stock exchange and the ratio of TMC to country-GDP

4 "Hong Kong" and "Macao" are cities in China but are separate entities in statistical records. We treat them as capital-cities like the city-state of Singapore.

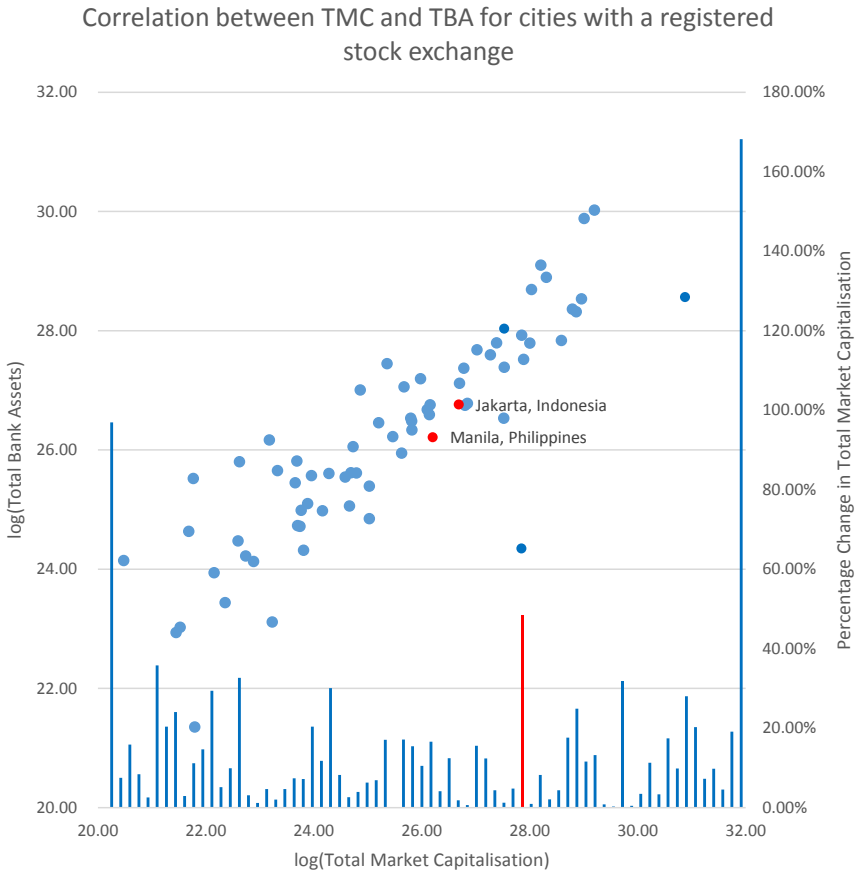

Figure 2. Average total TMC and TBA of cities with at least one registered stock exchange and percentage change in TMC from the previous ranked entry

is that an especially large percentage change in TMC suggests a qualitative difference between the two financial centres.

The horizontal axis lists the natural log of the average Total Market Capitalization (TMC) of each city with a stock exchange for the years 2013, 2014, and 2015 according to the World Federal of Exchanges (WFE). The vertical axis takes the Total Bank Assets in current USD without inflation adjustments, according to the Orbis Bank Focus. The right-axis indicates the percentage change in TMC between an entry and the previous one, in ascending order, alculated using $\log(x_n) - \log(x_{n-1})$. See the data section for details.

3.2. Likelihood factors for a financial centre

We estimate likelihood factors contributing towards a city becoming a financial centre using Probit regression.

Table 1. Probit regression of financial centre indicator against selected explanatory factors

Variable	Estimate	Standard error	Average partial effects
log(TBA)[5] in USD	0.3798**	0.0305	0.0473
Common law ind (0/1)	0.4463**	0.1414	0.0584
Credit regulation score (1-10)	0.0161	0.0501	0.0020
Labor regulation score (1-10)	–0.1535**	0.0525	–0.0191
Business regulation score (1-10)	0.0800	0.0647	0.0100
Capital city ind (0/1)	1.2960**	0.1141	0.2093

Note: Probit regression of financial centre occurrence against selected dependent variables. N·T = 1,502 observations. Year fixed-effects for 2013, 2014, 2015 omitted; "log" indicates natural logarithm; * indicates 5% (two-sided) significance level; ** indicates 1% significance level.

5 Natural logarithm

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3.3. Good jobs and high incomes

We estimate if the financial centre factor contributes towards providing "good jobs" and "high incomes" to a city. We use the predicted probabilities from the Probit regression earlier as an instrument for the financial centre indicator and estimate using two-stage least-squares.

Table 2. The effect of financial centre status and other selected explanatory factors on GDP per capita and percentage of jobs in finance and business

Variable	Percentage employment in finance and business		Log of GDP per capita	
	Estimate	Standard error	Estimate	Standard error
Financial centre instrument (0/1)	0.0928	0.1220	—3.0322	2.1814
log(TBA) in USD	0.0052	0.0050	0.2810**	0.0896
Common law ind (0/1)	0.0057	0.0091	—0.2013	0.1620
Credit regulation score (1-10)	0.0079**	0.0021	0.1684**	0.0370
Labor regulation score (1-10)	0.0121*	0.0057	0.0789	0.1017
Business regulation score (1-10)	0.0005	0.0041	0.2883**	0.0733
Capital city ind (0/1)	—0.0289	0.0289	0.1492	0.5169
Adjusted R^2	0.1698		—0.0697	

Note: Linear regression of percentage employment in finance and business and log of GDP per capita in each city against selected dependent variables. N·T = 1,502 observations. Year fixed-effects for 2013, 2014, 2015 omitted. "Log" indicates natural logarithm; * indicates 5% (two-sided) significance level; ** indicates 1% significance level.

3.4. TMC versus TBA among financial centres

We repeat the analysis above but limit the sample to cities with financial centre status. We want to know if increasing the TMC of a financial centre will enhance its capacity to bring "good jobs" and "high incomes" to the city as compared to TBA. This is a "bank-based" versus "capital-based" comparison.

Table 3. The effect of Total Market Capitalization, Total Bank Assets, and other selected explanatory factors on GDP per capita and percentage of jobs in finance and business

Variable	Percentage employment in finance and business		Log of GDP per capita	
	Estimate	Standard error	Estimate	Standard error
log(TMC) in USD	–0.0087*	0.0042	–0.0599	0.0446
log(TBA) in USD	0.0233**	0.0054	0.2235**	0.0564
Common law ind (0/1)	0.0012	0.0116	-0.2991*	0.1218
Credit regulation score (1-10)	0.0116**	0.0038	0.0353	0.0405
Labor regulation score (1-10)	0.0057	0.0045	0.1048*	0.0476
Business regulation score (1-10)	0.0085	0.0051	0.4649**	0.0532
Capital city ind (0/1)	–0.0202	0.0109	–0.1615	0.1144
Adjusted R^2	0.2702		0.5586	

Note: Linear regression of percentage employment in finance and business and log of GDP per capita in each city against selected dependent variables. N·T = 191 observations. Year fixed-effects for 2013, 2014, 2015 omitted. "log" indicates natural logarithm; * indicates 5% (two-sided) significance level; ** indicates 1% significance level.

4. DISCUSSION

4.1. Tiers of financial centres

From Figure 1 of Section 3.1. one can see that New York is an outlier with much higher TMC (US$ 25.7 trln) than the next two options Tokyo (US$ 4.8 trln) and London (US$ 3.9 trln). Verdier (2002) did explain that TMC is not the only reason why London is special. We do not have a basis for debating whether New York is different from London and the others. Instead we examine if there are other financial centres that are similar to London.

The two criteria we use to define a "global" financial centre are "total TMC above one trln USD" and "TMC greater than country GDP". The one-trln USD cut-off is admittedly somewhat arbitrary and should shift across time. The general idea is that although size is not the only factor it is still

an important one. The ratio of average TMC to average country GDP across time is loosely related to the concepts of "international appeal" and a "capital-based" system. If a financial centre has high TMC compared to the country's own GDP, then it is indicative of the importance of foreign capital in the stock exchange.

The cities in our sample that satisfy both criteria are Stockholm, Zurich, Toronto, Amsterdam, London, Tokyo, and New York, in ascending TMC order. The NY-LON axis (Wójcik, 2013) is still there and Sassan (1991) historical choice of Tokyo (TMC = USD 4778 bln, ratio = 1.0512) is still valid based on our criteria. Singapore's TMC to GDP ratio is high enough (1.1619) but the USD 69.6 bln falls slightly short. Luxembourg failed both our criteria by a lot. Incidentally all the listed cities also have average TBA above one-trln.

McGuire and Chan (2000) claim that Hong Kong is "not in the same league" depends on whether Hong Kong should be considered a separate economy or a part of China's. Public cross-country datasets such as the UNCTAD or the World Bank treat Hong Kong as a separate economy and we obtain the TMC/GDP ratio of 10.8825. If we accept Noble and Rabinovitch (2014) view that Hong Kong is a gateway for Chinese companies then the ratio becomes 0.3071. Either way, according to our criteria, the Chinese economy is not a capital-based system (yet). Even if we add Shenzhen (0.2508) and Shanghai (0.3644) to Hong Kong, the total TMC to GDP ratio becomes 0.9222, still lower than one and still lower than New York's 1.4790.

As for the existence of so-called "regional" financial centres, results in Figure 2 of Section 3.1. show a 48.5% increase in average TMC between Manila (USD 23.9 bln) and Jakarta (USD 38.9 bln). This corresponds to an overall difference in economic scale or development between countries on the two sides of the divide. The secondary "average TMC greater than average GDP" criteria was ineffective because stock exchanges at this scale have smaller average TMC and do not exceed the GDP of their countries. Perhaps size and international appeal are empirically related.

4.2. Emergence of financial centres

From Table 1 of Section 3.2. we can see that the high TBA (average partial effects = 0.0473**) and the capital city indicator (APE = 0.2093**) are positively associated with the appearance of a financial centre as expected. The association with the common-law indicator (APE = 0.0584**) is also positive and significant, consistent with the adaptability criteria as suggested by Beck et al (2003). The labor regulations score parameter is negative (APE = –0.0191**) and significant. This supports the claim from Busse and Groizard (2008) suggests that more labor regulations might reduce foreign investment.

4.3. Benefits of governing a financial centre

From Table 2 of Section 3.3. it seems that the two factors that matter for creating employment in finance and business are credit regulation quality (0.0079**) and labor regulation quality (0.0121*). The positive correlation with capital market regulations confirms the earlier predictions by Jacobzone et al. (2010) and Parker and Kirkpatrick (2012), as well as Calvo et al. (2006) for developing countries.

The correlation with labor regulations is also positive, siding with the views of Djankov et al. (2006). Locations with more lenient labor regulations might be more likely to be a financial centre, but being a financial centre does not lead to higher concentrations of employment in finance and business.

For raising the GDP per capita of the city, the three factors that matter are total banking assets (0.0280**), credit regulation quality (0.1684**), and business regulation quality (0.2883**). The first result reinforces the notion that it isn't the financial centre status that mattered, but the concentration of banks and their wealth. The second and third results represent constraints placed on banks as corporations. The concern from Bertus et al. (2007) that excessive banking regulation might be harmful is not supported here. On the contrary, the results are consistent with Barth et al.'s (2013) suggestion that a suit-

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able level of regulation is best. We note that the Bertus study was conducted before the Financial Crisis and The Great Recession of 2008–2009 while the Barth study was conducted after.

4.4. Banking versus investment capital

In Table 3 of Section 3.4. we see that, among financial centres, TMC is negatively associated with percentage of laborers in finance & business (–0.0087*), while there is no significant effect for GDP per capita. This supports the older views from Boyd and Prescott (1986) or Bhide (1993) that bank-based systems are more important for development.

We suspect this is because our sample begins in 2013, when many developing countries have just created their own stock exchanges to investors. The results might be confirming the suggestion from Demirguc-Kunt et al. (2011) that bank-based systems are more suitable for countries in the earlier stages of development. We do not believe that the negative sign for the TMC parameter literally means that a vibrant stock exchange is actively bad. But an increase in TBA is definitely more significant.

CONCLUSION

The accumulation of total banking assets (TBA) is more important for a city's development than its total market capitalization (TMC). This lends support to the "banking-based" system argument that, for most economies, strengthening the banking system is more important than building up an open stock exchange. The quality of credit regulations and business regulations of the country that the city belongs to are also positively associated with creating financial employment and raising GDP per capita. The excessive regulations concern is not supported in this study.

Capital city status and the common law legal system increases the odds that a stock exchange appears in a city, while stricter labor regulations are a negative factor. However, we do not find evidence that having a stock exchange improves a city's development. TBA is a positive factor as well so perhaps the visible benefits of a financial centre do not come from its vibrant financial trading but its banking sector. The close correlation between a city's TBA and TMC may be a source of obfuscation.

Inferential observation of our sampled stock exchanges has identified three groups of financial centres, which we label "global", "international", and "regional" for exposition. Our working definition of an "international" financial centre is "US$ one trln TMC" and "average TMC greater than total GDP". Cities that satisfied both criteria are, in ascending order of TMC, Stockholm, Zurich, Toronto, Amsterdam, London, Tokyo, and New York. China has three stock exchanges with TMC over one trln – Hong Kong, Shanghai, Shenzhen – but their TMC even together is not the highest when compared to the size of China's total GDP.

There is also a TMC gap between 'local' and 'regional' financial centres that exists within developing countries with different economic sizes. In our sample, this gap exists between Manila and Jakarta; we expect the actual drawing line to be transient, but the concept remains. The lesson is that although these places are all developing countries, their stock exchanges are quite different and should not just be broadly grouped together as outside the West.

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REFERENCES

1. Acuto, M., & Steele, W. (2013). *The palgrave macmillan global city challenges: debating a concept, improving the practice.* New York: Palgrave Macmillian.
2. Allen, F. and Gale, D. (1999). *Corporate governance and competition* (Working papers 99-28). Wharton school centre for financial institutions, University of Pennsylvania. Retrieved from https://core.ac.uk/download/pdf/6649976.pdf
3. Allen, F., & Gale, D. (2000). Optimal currency crisis. *Carnegie-Rochester conference series on public policy, 53*(1), 177-230. https://doi.org/10.1016/s0167-2231(01)00030-6
4. Arestis, P., Demetriades, P. O., & Luintel, K. B. (2001). Financial development and economic growth: the role of stock markets. *Journal of Money, Credit and Banking, 33*(1), 16-41. https://doi.org/10.2307/2673870
5. Barth, J. R., Caprio, G. J., & Levine, R. (2013). *Bank regulation and supervision in 180 countries from 1999 to 2011* (Working paper 18733). https://doi.org/10.3386/w18733
6. Barth, J. R., Gan, J., & Nolle, D. E. (2009). *Global banking regulation and supervision: what are the issues and what are the practices? (Financial institutions and services series).* Washington DC: Nova Science Publishers.
7. Beaverstock, J. V., Smith, R. G., & Taylor, P. J. (2000). World city network: a new metageography. *Annals of the Association of American Geographers, 90*(1), 123-134. Retrieved from https://pdfs.semanticscholar.org/a717/ea783fe26977bb88a7e00c164e6b1203a384.pdf
8. Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: panel evidence. *Journal of Banking & Finance, 28,* 423-442. https://doi.org/10.1016/s0378-4266(02)00408-9
9. Beck, T., Demirguc-Kunt, A., & Levine, R. (2003). *Bank supervision and corporate finance* (NBER working papers No. 9620). https://doi.org/10.1596/1813-9450-3042
10. Bertus, M., Jahera, J. S., & Yost, K. (2007). The relation between bank regulation and economic performance: a cross-country analysis. *Banks and Bank Systems, 2*(3), 32-45. Retrieved from https://businessperspectives.org/images/pdf/applications/publishing/templates/article/assets/1896/BBS_en_2007_03_Bertus.pdf
11. Bhide, A. (1993). The hidden cost of stock market liquidity. *Journal of Financial Economics, 34*(1), 31-51. https://doi.org/10.1016/0304-405x(93)90039-e
12. Bishop, J., Kent, C., Plumb, M., & Rayner, V. (2013). The resources boom and the Australian economy: a sectoral analysis. *RBA Bulletin, Reserve bank of Australia,* 39-50. Retrieved from https://www.rba.gov.au/publications/bulletin/2013/mar/pdf/bu-0313-5.pdf
13. Boyd, J., & Prescott, E. (1986). Financial intermediary-coalitions. *Journal of Economic Theory, 38,* 211-232. https://doi.org/10.1016/0022-0531(86)90115-8
14. Bryant, M. (2010). *Toronto as centre of global finance?* Retrieved from http://globalbrief.ca/blog/2010/10/13/how-does-toronto-become-a-top-centre-for-global-finance/
15. Busse, M., & Groizard, J. L. (2008). Foreign direct investment, regulations and growth. *The world economy, 31*(7), 861-886. https://doi.org/10.1111/j.1467-9701.2008.01106.x
16. Calvo, G. A., Izquierdo, A., & Talvi, E. (2006). *Phoenix miracles in emerging markets: recovering without credit from systemic financial crises* (BIS working papers No. 221).
17. Cassis, Y. (2006). *Capitals of capital: the rise and fall of international financial centres 1780-2009.* New York: Cambridge University Press.
18. Cassis, Y. (2011). *Crisis and opportunity: the shaping of finance.* New York: Oxford University Press.
19. Cheung, L., & Yeung, V. (2007). *Hong Kong as an international financial centre: measuring its position and determinates* (Working paper No. 14/2007). Hong Kong Monetary Authority.
20. Corbett, J., & Jenkinson, T. (1996). How is investment financed? A study of Germany, Japan, the United Kingdom and the United States. *The Manchester school of economic and social studies, 65*(S), 69-93. https://doi.org/10.1111/1467-9957.65.s.4
21. Demirguc-Kunt, A., & Levine, R. (2001). *Bank-based and market-based financial systems: cross-country comparisons* (Policy, Research Working Paper No. WPS 2143). Washington, DC: World Bank. Retrieved from http://documents.worldbank.org/curated/en/259341468739463577/Bank-based-and-market-based-financial-systems-cross-country-comparisons
22. Demirguc-Kunt, A., & Maksimovic, V. (1998). *Institutions, financial markets and firms' choice of debt maturity* (Policy, Research Working Paper No. 1686). Washington, DC: The World Bank.
23. Demirguc-Kunt, A., Feyen, A., & Levine, R. (2011). *The evolving importance of banks and securities markets* (Policy, Research Working Paper No. 5805). Washington, DC: The World Bank. Retrieved from http://siteresources.worldbank.org/EXTFINANCIALSECTOR/Resources/Banks_and_SecuritiesWP5805.pdf
24. Djankov, S., McLiesh, C., & Shleifer, A. (2006). *Private credit in 129 countries* (NBER Working Paper Series No. 11078). Retrieved from https://dash.harvard.edu/bitstream/handle/1/27867134/w11078.pdf?sequence=1
25. Dorrucci, E., Meyer-Cirkel, A., & Santabarbra, D. (2009).

http://dx.doi.org/10.21511/bbs.13(4).2018.15

Domestic development in emerging economies. European central bank (Occasional Paper Series No. 102). Retrieved from https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp102.pdf?81f3a846ce27c64ae419d6fa3e1bbd4b

26. Elliot, M. (2008). A tale of three cities. *TIME.* Retrieved Jan 14, 2015, from http://content.time.com/time/magazine/article/0,9171,1704398,00.html
27. Fraser Institute (2018). *Economic Freedoms of the World (EFW) indices*. Retrieved from https://www.fraserinstitute.org/sites/default/files/economic-freedom-of-the-world-data-for-researchers.xls
28. Gehrig, T. (2000). Cities and the geographies of financial centres. In J. M. Huriot & J. F. Thisse (Eds.), *Economies of cities: theoretical perspectives.* Cambridge: Cambridge University Press.
29. Gilliland, A. (2013). Choosing the federal capital: a comparative study of the United States, Canada and Australia. In *The problem of the capital city*. Barcelona: Institut d'Estudis Autonomics.
30. Gordon, B., Blomquist, J., Yu, X., & Burnett, N. (2003). Social safety net priorities in East Asia. In C. Park & K. W. Lee (Eds.), *Globalization and social safety nets in the Asia-Pacific region*. Seoul: APEC.
31. Hicks, J. A. (1969). *A theory of economic history.* Oxford: Claredon Press.
32. Huat, T. C., Lim, J., & Chen, W. (2004). *Singapore as a financial centre: development and prospects*. Paper presented at the saw centre for financial studies and ISEAS conference, Singapore.
33. Jacobzone, S., Steiner, F., Ponton, E. L., & Job, E. (2010). *Assessing the impact of regulatory management systems: preliminary statistical and econometric estimates* (OECD Working Papers on Public Governance, No. 17). https://doi.org/10.1787/5kmfq1pch36h-en
34. JuriGlobe (n. d.). *Legal Systems Classification*. Retrieved from http://www.juriglobe.ca/eng/sys-juri/index.php
35. Kindleberger, C. P. (1974). *The formation of financial centres: a study of comparative economic history*. Princeton: Princeton University Press.
36. La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2006). What works in securities laws? *The Journal of Finance*, *61*(1), 1-32. https://doi.org/10.1111/j.1540-6261.2006.00828.x
37. La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy, 106*(6), 1113-1155. Retrieved from https://scholar.harvard.edu/files/shleifer/files/law_finance.pdf
38. Levine, R. (2002). Bank-based or market-based financial systems: which is better? *Journal of Financial Intermediation 11*(4), 398-428. https://doi.org/10.1006/jfin.2002.0341
39. Levine, R., & Zervos, S. (1998). Stock Markets, Banks, and Economic Growth. *The American Economic Review, 88*(3), 537-558. Retrieved from https://www.isid.ac.in/~tridip/Teaching/DevEco/Readings/07Finance/06Levine&Zervos-AER1998.pdf
40. Long, J. A., & Tan, D. (2010). The growth of the private wealth management industry in Singapore and Hong Kong. *Capital markets law journal, 6*(1), 104-126. https://doi.org/10.1093/cmlj/kmq022
41. McGuire, S., & Chan, M. (2000). The NY-LON life. *Newsweek,* 40-47.
42. Ngiam, K. J. (1996). Singapore as a financial center: new developments, challenges, and prospects. In I. Takatoshi & A. O. Krueger (Eds), *Financial deregulation and integration in East Asia.* Chicago: University of Chicago Press.
43. Noble, J., & Rabinovitch, S. (2014). Link with Shanghai major victory for Hong Kong exchange. *The Economist*. Retrieved January 15, 2015, from https://www.ft.com/content/79277ece-c099-11e3-8578-00144feabdc0
44. Parker, D., & Kirkpatrick, C. (2012). *Measuring regulatory performance* (OECD Expert Paper No. 2). Paris: The Organisation for Economic Co-operation and Development. Retrieved from https://www.oecd.org/gov/regulatory-policy/2_Radaelli%20web.pdf
45. Pavoni, S. (2013). London leads again. IFC rankings. *The Banker,* 192-196. Retrieved from http://www.caymanfinances.com/file/2013/11/the-banker-ifc-rankings-2013.pdf
46. Porteou, D. (1999). The development of financial centres: location, information externalities and path dependence. In R. Martain (Ed.), *Money and the space economy* (pp. 96-114). Chichester: John Wiley & Sons Ltd.
47. Robinson, J. (1952). *The Generalization of the General Theory in the Rate of Interest and Other Essays.* London: Macmillan.
48. Rossi, V. (2009). *Which Sectors Will Lead the Recovery?* Chatham House Briefing Note.
49. Sassen, S. (1991). *The Global City: New York, London, Tokyo.* Princeton: Princeton University Press.
50. Sassen, S. (1999). Global Financial Centres. *Foreign Affairs, 78*(1), 75-87. https://doi.org/10.2307/20020240
51. Stigler, G. J. (1964). Labour and Capital. In *Capital and Rates of Return in Manufacturing Industries,* 92-104.
52. Tan, C. H., & Lim, J. Y. S. (2007). *Singapore and Hong Kong as Competing Financial Centres.* Singapore: Saw Centre for Financial Studies.
53. Verdier, D. (2002). *Moving Money: Banking and Finance in the Industrialised World.* Cambridge: Cambridge University Press.
54. Wall, R. S., & van der Knaap, G. A. (2011).

Sectoral differentiation and network structure within contemporary worldwide corporate networks. *Economic Geography, 87*(3), 267-308. https://doi.org/10.1111/j.1944-8287.2011.01122.x

55. Wintersteller, M. (2013). Luxembourg's financial centre and its deposits. *ECFIN Country Focus, 10*(9). Retrieved from http://ec.europa.eu/economy_finance/publications/country_focus/2013/pdf/cf_vol10_issue9_en.pdf
56. Wojcik, D. (2011). *The global stock market: issuers, investors, and intermediaries in an uneven world*. Oxford: Oxford University Press.
57. Wojcik, D. (2013). *The dark side of NY-LON: financial centres and the global financial crisis Urban Studies, 50*(13), 2736-2752. https://doi.org/10.1177/0042098012474513
58. Z/Yen Group (2005). *The competitiveness position of London as a global financial centre*. London: Long Finance.

http://dx.doi.org/10.21511/bbs.13(4).2018.15