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Adjustment After the Crisis – Will the Financial Sector Shrink and Entrepreneurship Boom?

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I. The Crisis as a Schumpeterian Event and the Chance of Human Capital Re-allocation

We are living through historic times. The world economy is suffering from one of the greatest financial crises of all times and we cannot yet know its full consequences for the financial system, the economy or society as a whole. Not surprisingly, most commentators focus on the dangers and damages that the crisis brings with it: The crisis as a destroyer of wealth, the crisis as a threat for growth and free world trade, the crisis as a threat for our living-standards and so forth.

In this article we offer an alternative view, looking at the crisis as a Schumpeterian event, i.e. a process of creative destruction, at the macro level. Most creative destruction takes place at the micro level when innovative young firms fundamentally change production processes or bring new and superior products to market. Due to the pressure of new inventions commercialized by competing entrants the profits of incumbent firms fall, their dominance vanishes and ultimately they are squeezed out of the market. Creative destruction at the micro level can be regularly observed whereas creative destruction at the macro level has almost fallen into oblivion.[1] However, from time to time there are Schumpeterian events at the macro level. The great crisis of the late 1920's and early 1930's was such an event and we presume that the current crisis has a similar potential to fundamentally re-shape the world economy.

There can be little doubt that the crisis will set free (or make obsolete) a significant amount of productive resources, in particular human resources. Whether this is good or bad news for long-run economic growth is not clear ex ante; it depends on whether these resources will find their way into more productive occupations or if they will move to less-productive occupations or stay unemployed. Hence, the question how human capital is re-allocated during and after the crisis is pivotal in understanding the impact of the crisis on long-term economic growth.

The sector most directly and heavily struck by the crisis is the financial sector. At least in the U.S., the financial sector has ballooned dramatically in size in recent years. Boykin Curry, managing director of Eagle Capital was quoted in NEWSWEEK magazine, stating that: "30 percent of S&P profits last year were earned by financial firms, and U.S. consumers were spending $ 800 billion more than they earned every year. As a result, most of our top math PH.D.s were being pulled into nonproductive financial engineering instead of biotech research and fuel technology." The view that the financial sector has become too large and will have to shrink is shared by the new U.S. administration under President Barack Obama. The financial sector will make up a smaller part of the U.S. economy in the future as new regulations clamp down on "massive risk-taking", Obama said in an interview published in the New York Times Magazine on Saturday May 2, 2009. He explicitly welcomed that this

[1] Indeed, Daron Acemoglu argues that in view of the crisis one of the most significant intellectual failures of the economists' profession has been that we have thought that " ... the era of aggregate volatility had come to an end" (Acemoglu 2009).

would lead to a more productive allocation of talent, stating that "We don't want every single college grad with mathematical aptitude to become a derivatives trader" (ibid.). MIT economist Esther Duflo goes in the same vein when writing: "What the crisis has made bluntly apparent is that all this intelligence is not employed in a particularly productive way. Admittedly, a financial sector is necessary to act as the intermediary between entrepreneurs and investors. But the sector seems to have taken a quasi-autonomous existence without close connection with the financing requirements of the real economy."

So, can we be optimistic that the crisis will stop the misallocation of human capital into the financial sector? Will some of the brilliant minds on Wall Street or the financial districts in London, Frankfurt and Tokyo end up as entrepreneurs, inventors or engineers, using their creative energies socially more usefully? In a nutshell: Can we expect a higher growth dynamics after the crisis due to a more efficient allocation of human capital?

The answer is: *It depends*. Long term economic growth is driven by innovation and, in particular, by innovative firm start-ups. Such innovation requires:

(i) a sufficient supply of highly-qualified, entrepreneurial people,
(ii) adequate finance,
(iii) an innovation-prone macroeconomic environment.

Hence, the course of the investigation in the remainder of this paper is as follows: In the next section (II) we analyse if there is – apart from the prominent opinions quoted above – empirical evidence for overbanking in the U.S. and in continental Europe such that we can expect an increasing supply of entrepreneurial talent from the finance sector. Section III focusses on the availabilty of adequate finance instruments (private equity, in particular) for young, fast growth but asset poor firms. Section IV discusses the macroeconomic environment for innovation in the U.S. and in continental Europe and how it is affected by the crisis. Section V concludes.

II. The Size of the Financial Industry and the Potential for Re-allocation of Human Talent in the U.S. and Europe

This section deals with the question of to what extent the financial industry in the U.S. and Europe has in fact grown oversize, and to what extent bright minds employed in this industry so far may be redirected to socially more beneficial activities in other industries, where they can contribute more to future economic prosperity.

Overbanking in the U.S.

Figure 1 shows that the share of the financial industry in total value added (upper, blue line) has increased not only during the recent years but in fact more or less continuously for several decades. It roughly doubled from about 4 % in the early 1970s to about 8 % in the mid 2000s. The Figure also shows that the financial industry's share in total compensation

paid to employees[2] increased at a similar rate as that in value added. What is striking is that its share in total employment did not grow in parallel to its shares in value added or compensation. It remained constant, or even decreased slightly from the late 1980s. This implies that the average wage per worker grew significantly faster in the financial industry than in other industries of the economy.[3]

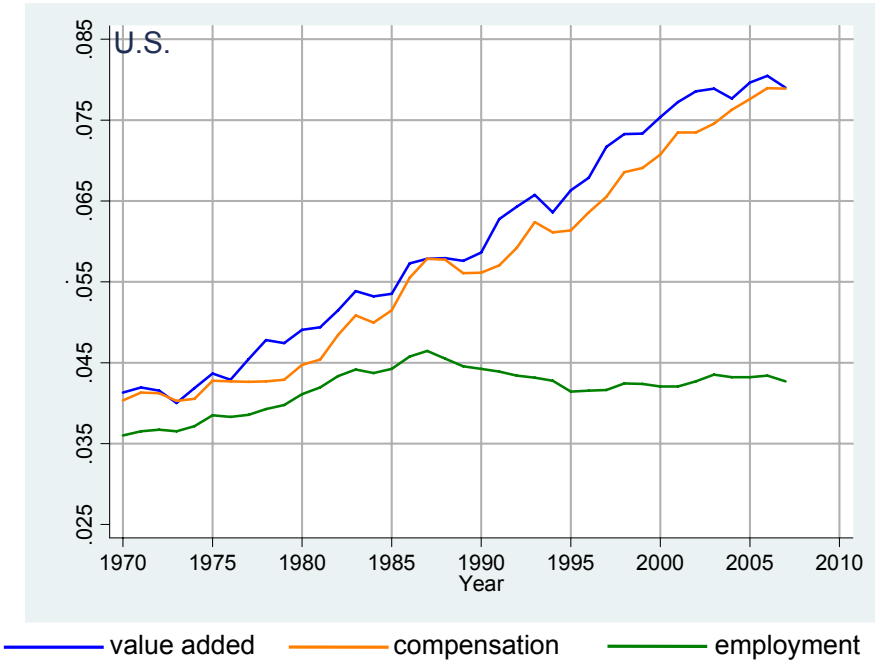

Figure 1: Shares of the U.S. financial industry in total value added, compensation, and employment 1970 – 2007. *Source:* OECD (2008).

In detailed studies of the financial industry in the U.S., Philippon (2008a) and Philippon and Reshef (2009)[4] argue that a substantial part of the faster growth of value added and wages of the financial industry up to 2001 can be explained as an efficient market response to demands created by the IT revolution. The IT revolution created vast opportunities for innovations in a variety of sectors, which were exploited and marketed to a good deal by young, innovative, fast growing but cash-poor firms. Microsoft or Google in their early years are just a few examples of these firms. In contrast to large incumbent firms that are able to cover much of their investment costs from their own cash flow or from accessing financial markets directly, these young firms need specialized, sophisticated external financial services. The financial industry supplied them with these services, thereby contributing to overall growth

[2] Compensation of employees comprises of wages and salaries to employees paid by producers as well as supplements such as contributions to social security, private pensions, health insurance, life insurance and similar schemes.

[3] The ratio between the compensation and employment figures depicted in Figure 1 can be interpreted as an average relative wage in the financial industry. It grew from 1.1 in the early 1970s to more than 1.8 in the mid-2000s (for more on this see Figure 3, below).

[4] For a summary and discussion of results also see Philippon (2008b) and Philippon (2009).

and prosperity.[5] To supply these sophisticated financial services, the industry had to significantly upgrade its staff's skills. Clerks and other low- and medium-skilled employees had to be substituted by high-skilled investment bankers and specialized financial experts who are able to create innovative, customized solutions to the financial problems faced by young, fast-growing companies. As a consequence, the share of university graduates in total employment increased by almost 13 percentage points since the early 1980s (to 42 % in the early 2000s) in the financial industry but only about 5 percentage points (to 25 %) in the whole U.S. economy.[6] This skill upgrading explains, however, only part of the faster growth of wages in the financial industry. The remaining part obviously consisted of "rents" accruing from highly profitable – still socially productive – services provided to the real economy. Philippon and Reshef (2009) show that these "rents" were particularly high for highly educated workers on the one hand, and in the subsector "other finance" on the other. "Other finance" includes venture capital funds, private equity, investment banking, hedge funds, trusts, securities, and commodities.[7]

The continuation of the faster growth of value added and wages of the financial industry after 2001, however, can not be explained by demand created by the IT revolution. Even though growth in demand for financial intermediation from the non-financial corporate sector decelerated, the financial industry managed to continue to increase its share in the economy by increasingly engaging in developing overly risky and fragile financial products that were highly profitable but proved ex post socially harmful (Philippon 2008b). This allowed the industry to further increase relative wages and to continue to attract high skilled workers. Both the skill upgrading and the increase in wages and rents was still concentrated in the subsector "other finance" (Philippon and Reshef 2009). In contrast to the previous decades, rents seem to have accrued increasingly from socially unproductive activities, however, including those of hiding financial risks of subprime mortgages.

In summary, while much of the faster growth of the U.S. financial industry over the 1980s and 1990s can be explained as part of an efficient market response to the increasing importance of young, cash-poor and innovative firms in the U.S. economy, the industry clearly grew oversized in the years preceding the current financial and economic crisis. The growth of the industry and the high wages paid in the industry made it attractive for a large number of highly qualified workers. It is still too early for predicting to what extent markets and regulation will force the financial industry and its wages to shrink during the current crisis. It is clear, however, that a correction of the overbanking of recent years holds the potential to increase future economic prosperity by redirecting bright minds to socially more beneficial activities in other industries in the U.S.

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5 Philippon and Reshef (2009) argue that the ability of the U.S. financial industry to serve the needs of such young and fast growing firms was greatly facilitated by the extensive deregulations of this industry during the 1980s and 1990s. We will return to the role of regulation for the capability of the financial industry for fuelling economic growth in the following subsection.

6 Source: EU KLEMS Project (2008).

7 The other two subsectors of the financial industry are "credit intermediation" and "insurance".

Overbanking in Europe

Is the current situation of the financial industry in Europe comparable to that in the U.S.? The available data suggest that the employment, value added, and compensation shares of the European financial industries evolved in similar directions as those in the U.S. Like in the U.S., the shares of the financial industries in total employment tended to decrease, and those in value added and compensation to increase in Europe. There are, however, marked differences within Europe, in so far as the development in the United Kingdom (UK), the only European economy with a truly global financial centre (London), is more similar to that in the U.S. than that in continental Europe. Focusing on Germany and France as the two largest economies in continental Europe,[8] we observe, first, that the financial industry has been significantly smaller in continental Europe than in the UK and the U.S. (Figure 2).

It accounted for roughly 3 % of total employment and 4.5 % of total value added in the mid-2000s, compared to roughly 4 % and 8 % in the UK and the U.S. Second, the value added and compensation shares grew much slower in continental Europe than in the UK and the U.S. since the early 1980s. They even stagnated in some of the continental European countries, including France.

In fact, the relative wages (compensation per worker) in the financial industry increased much slower in continental Europe than in the UK or the U.S. (Figure 3). In recent years, workers in the financial industry have been paid about 60 % more than workers in other industries in Germany and France but about 85 % more in the UK and the U.S.

[8] Since comparable data is not available for all European countries, we focus on the three largest West European economies, Germany, France and the UK. These three countries currently account for about 52 % of total GDP in the EU 27. The data available for other European countries indicate that the evolutions of the financial industries in Italy, Denmark, Belgium, Austria, Finland fit pretty well into the general picture we are drawing here for continental Europe (Germany and France), while those in Ireland, Iceland and The Netherlands are more similar to those in the UK. Spain appears to be sort of an outlier. Its financial industry lost not only in terms of employment but also in terms of value added and compensation since the early 1990s.

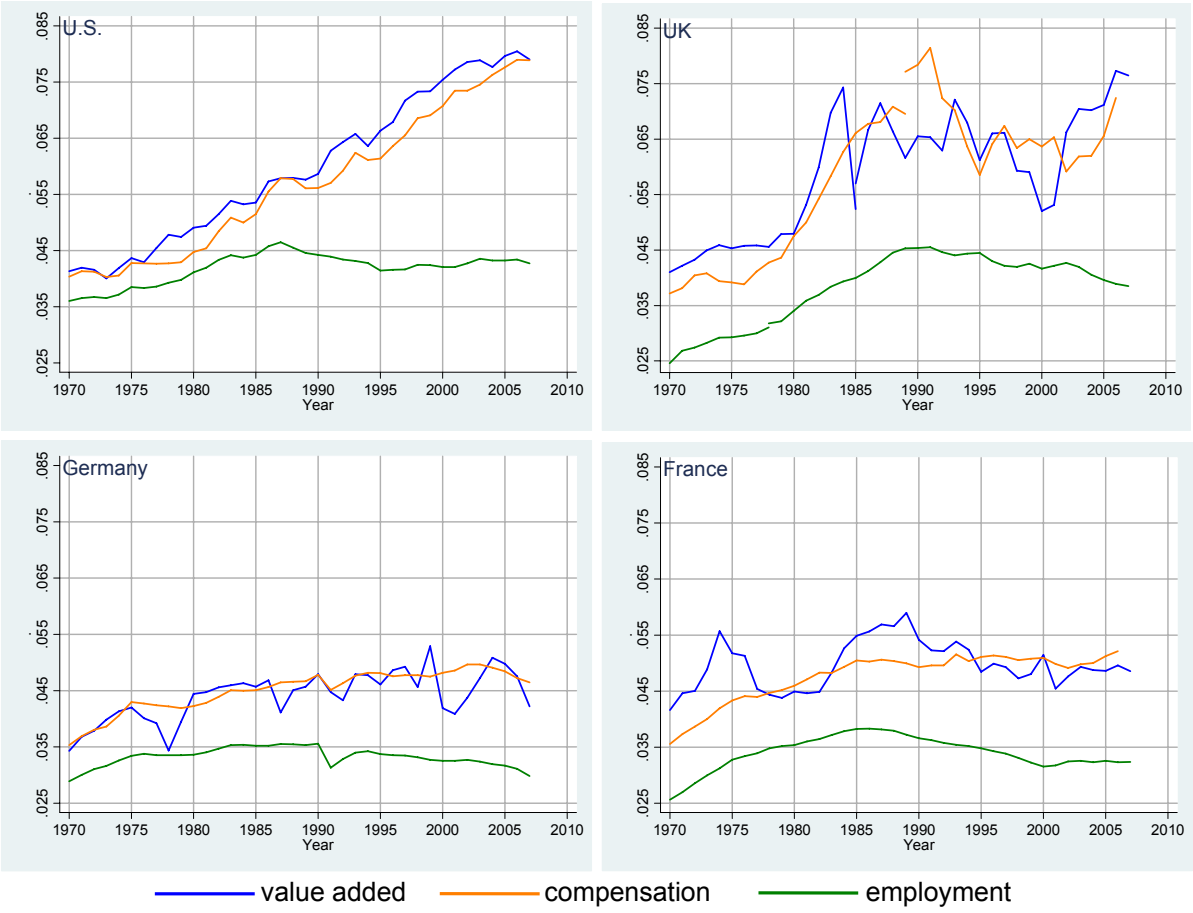

Figure 2: Shares of the financial industry in total value added, compensation, and employment in the U.S., United Kingdom, Germany, and France 1970 – 2007. *Source:* OECD (2008), EU KLEMS Project (2008).

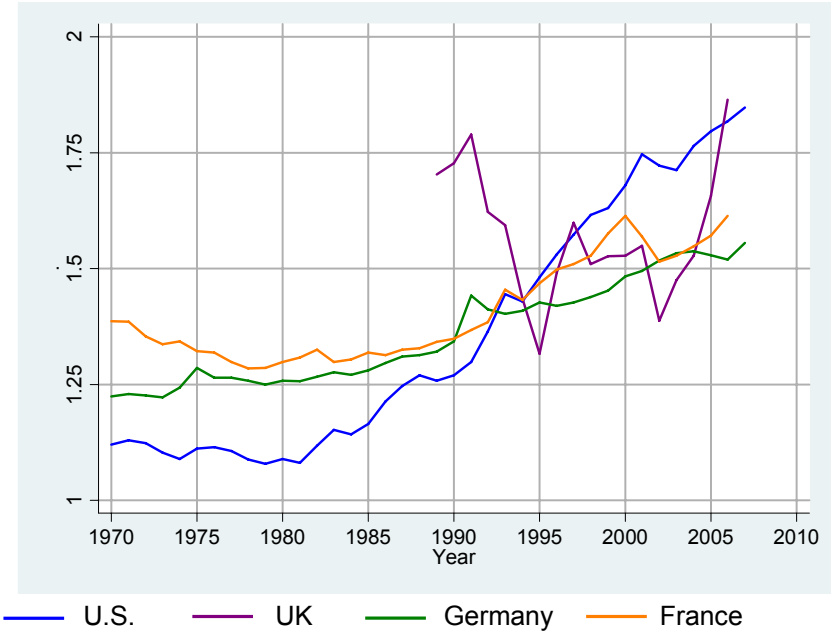

Figure 3: Average compensation per worker in the financial industry relative to that in all industries in the U.S., United Kingdom, Germany, and France 1970 – 2007 (UK: 1988 – 2006, France: 1970 – 2006). *Source:* OECD (2008).

These figures suggest that there is less evidence of overbanking for continental Europe than for the U.S. and the UK. The financial industry in continental Europe appears to have been less engaged, on aggregate, in those businesses that generated the high incomes and rents of the industry in the U.S. – both in the good, that is in the supply of sophisticated financial services to young, fast growing firms and in the bad, that is in the development of overly risky and fragile new financial products that proved ex post socially harmful. Even though skills upgrading was also higher in the financial industry than in other industries in virtually all European countries, including France and Germany (Table 1), this skills upgrading did not come along with similarly excessive increases of wages and rents in continental Europe as in the U.S.

Table 1:
Shares of university graduates in total employment in the financial industry and in all industries in Germany France, the United Kingdom and the U.S. 1980 – 2005

Country	Year	Share (%) of university graduates in		Difference
		Financial industry	All industries	
Germany	1980	.	.	.
	1991	7.9	7.7	0.2
	2005	11.1	9.5	1.6
France	1980	8.0	6.0	2.0
	1991	14.0	9.0	5.0
	2005	26.0	15.0	11.0
United Kingdom	1980	8.7	5.1	3.6
	1991	15.8	9.4	6.4
	2005	27.0	18.9	8.1
U.S.	1980	24.8	20.2	4.6
	1991	36.6	26.4	10.2
	2005	44.3	31.7	12.6

Source: EU KLEMS Project (2008).

While this suggests that the need for the financial industry and its wages to shrink is less in continental Europe than in the U.S. or the UK, less overbanking also implies that fewer bright minds have been misallocated so far, and fewer gains can be expected from re-allocating them to socially more beneficial, possibly innovative or entrepreneurial, activities in other industries in the future.

III. The Availability of Finance for Emerging Firms

In the previous section we discussed the current patterns in the financial sector, with emphasis on comparison between the U.S. (and UK) on the one hand and continental Europe (Germany, France) on the other. In this section, we deal with implications of a poten-

tial financial sector shrinkage on the supply of finance to fast growing, technology rich, but asset and cash flow poor young firms.

It is a well known concern that Europe needs more young firms (Commission of the European Communities 2009c) – and this need is likely to become more urgent in the current crisis, which will increase the need for structural adjustment. Young firms, located at the technology frontier are often better poised to grow fast, create disproportionately more employment, and contribute high valued added and skilled jobs. Unfortunately, the league tables do not show a strong showing of emerging firms in Europe. Figure 4, which admittedly deals with data for listed companies and hence captures only some of the activity in the emerging market, highlights how old European firms are compared to their U.S. counterparts. Here we observe the aging distribution of European firms vis-à-vis their U.S. counterparts. This chart tells us that a significantly higher number of U.S. firms founded in the period since 1976 managed to grow such that they met the FT Global 500 ranking criteria. This is not seen for European firms. According to Philippon and Véron (2008: 8), "…. young companies generally find it harder to emerge in Europe than in the U.S.. More specifically, many new firms are created in Europe, but thereafter they tend to grow less briskly than in other economies". A key reason for the much weaker *post entry* growth performance of European emerging enterprises is the restricted availability of growth finance in Europe (cf. Aghion et al. 2007).

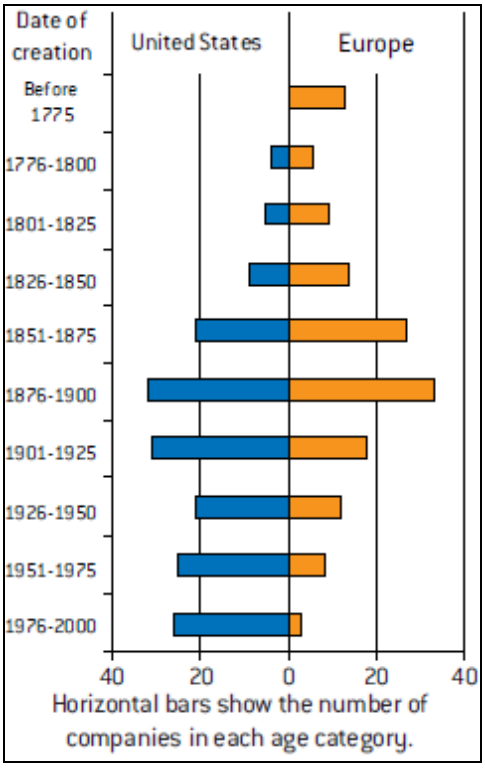

Figure 4: Population pyramid for largest U.S./European companies. *Source:* Philippon and Véron (2008): calculations from the FT Global 500 Ranking of the world's listed companies. Horizontal bars show the number of companies in each age category.

To meet their development needs, emerging firms rely on financial instruments quite different from established firms. Established firms are often publicly listed and have access to the corporate bond market or they generate significant cash flows and are therefore less dependent on external funds for expansion. Emerging firms, by contrast, typically don't have enough cash flows to cover their investment needs. Therefore, their growth prospects depend heavily on alternative financial instruments such as high-yield bonds, mezzanine capital and private equity. If it is right that the crisis will lead to an acceleration of structural change and creative destruction, then private equity will become even more important after the crisis.

Unfortunately, however, financial services for emerging firms in Europe are clearly underdeveloped relative to the U.S. and have constituted a significant impediment to firm growth even before the crisis (Philippon and Véron 2008). The level of private-equity activity is particularly low in central Europe (less so in the UK and Scandinavia), even for European standards (Figure 5).

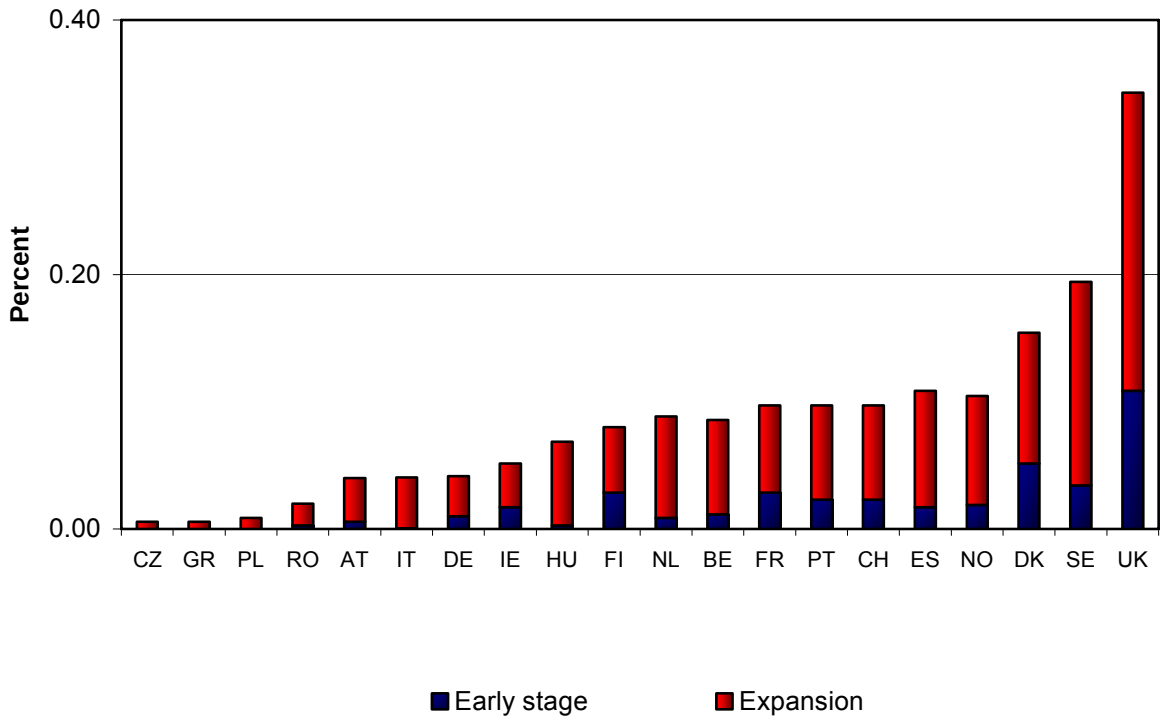

Figure 5: Private equity investment flows (% GDP), 2004-2006. *Source:* European Private Equity and Venture Capital Association (EVCA).

Moreover, the financial crisis has reached the private equity markets, meaning that the playing field for investment in innovation is getting smaller – at least in the short run. In the first quarter of 2009, the private equity market in Germany broke down dramatically. Total investment by German equity finance and venture capital firms shrunk to 335 million € as compared to 893 million € in the fourth quarter 2008 and 1.149 billion € a year before (BVK 2009a). The slump in total investment (which is the sum of early stage investment, later stage investment and buy-outs) is largely caused by the drastic diminution of buy-out

transactions, whereas the decrease in later stage investment was far less dramatic and early stage investment has so far been relatively stable in view of the crisis. However, given that capital shortage has been a problem for innovative German firms even in boom periods – Rammer (2009) argues that lack of capital has prevented 36 % of all firms from (further) investment in innovation in 2007 – the tense situation on the private equity market is likely to further depress the propensity to invest in innovation in Germany.

The U.S. venture capital and private equity market has seen a similar downturn in the first quarter of 2009.[9] However, the U.S. financial system was particularly strong in providing young, fast growing firms with private equity before the crisis (Gompers and Lerner 2004, Philippon and Véron 2008) and analysts expect a quick recovery of the U.S. private equity market after the crisis. Richard Addlestone, a private equity partner at Walkers was quoted saying that "… While further weakness can be expected in the short term, there are hopes for a return to pre-credit crunch levels of investment and returns within 18 months. The silver lining is that, with asset prices at current lows, 2009 could be a great year for acquisitions, but first banks need to start lending to each other and to businesses."

Avoid a Disproportionate Regulation of Private Equity

It has been argued above that before the current crisis, private equity in Europe (and in particular in Germany) was underdeveloped and in urgent need of expansion and that the crisis has made things even worse, at least in the short run. The medium and long-term prospects of private equity financing in Europe will in part depend on the policy reaction to the financial crisis. The crisis could, if it induces disproportionate regulation of private equity providers, further stifle growth in private equity provision and thereby feed through to emerging firms by lowering the supply of private equity finance available. Exacerbating the supply of private equity finance to emerging businesses by curtailing the amount of venture capital finance and private equity would carry a social cost to the European (and German) economy.

There is currently considerable discussion on the appropriate future regulation of private equity funds. In April 2009 the EU Commission has presented a proposal for a Directive on the (European-wide) regulation of the managers of so-called "Alternative Investment Funds" (AIFM Directive) (Commission of the European Union 2009a).[10] These include private equity funds alongside hedge funds, commodity funds and real estate funds and infrastructure funds. The Commission recognizes that different types of funds are associated with different types of risks to financial market participants (such as investors and counterparties) and to financial stability (macro-prudential or systemic risk). In particular, it explicitly states, that "private equity funds, due to their investment strategies and a different use of leverage than hedge funds, did not contribute to increase macro-prudential risks" (Commission of the Euro-

[9] According to PWC (2009) US venture capital and private equity investment in the first quarter of 2009 decreased to $ 3.0 billion. It was down 47 % from the fourth quarter 2008 and 61 % from the year before.

[10] The regulation of private equity funds, hedges funds and other types of funds is also the subject of ongoing discussion at international level, for example through the work of the G20, IOSCO and the Financial Stability Forum.

pean Union 2009a, p. 3). Despite these differences between the risks associated with different types of funds the Commission proposes a regulatory framework that subjects (managers of) all types of AIF to the same set of basic regulatory rules ("horizontal approach"), which, however should be "designed to as to be proportionate and sensitive to the differences between business models" (see European Commission 2009b: 5).[11]

Despite the Commission's avowal to the proportionality principle the proposed AIFM Directive is heavily criticized by the representatives of the private equity industry, such as the German Private Equity and Venture Capital Association (BVK). It considers the regulations proposed by Directive as disproportionate and inappropriate for private equity funds, as opposed to hedge funds, and suspects that the regulations proposed would increase the costs of private equity without providing additional benefits in terms of risk reduction (BVK 2009b). According to the BVK the Directive needs to be radically improved in order not to seriously impede the development of the European private equity sector.

This is certainly not the place for a detailed assessment of the merits and shortcomings of the proposed AIFM-Directive. Suffice it here to emphasize that given the importance of a well-functioning private equity market for the financing of young, innovative firms, special care should be exercised in designing a new regulatory framework for private equity funds in order not to 'throw out the baby with the bathwater'. An undifferentiated approach to the regulation of alternative investment funds and overregulation of private equity could cripple this already underdeveloped sector even further.

When the European economy emerges from the current financial and economic crisis, there has got to be adequate and appropriate financial provision for young, fast growing firms in new sectors, including an increased not reduced role for private equity finance. It is not the core task of traditional banking to operate in such collateral poor, high risk sectors but rather the task of more specialist financial providers i.e. private equity providers and venture capitalists. Policy makers should be careful to legislate in a way that addresses the sensitivity of emerging businesses to the supply of equity from this sector.

IV. Exchange Rate Uncertainty, Export Dependence and Innovative Activity

As mentioned in the introduction, the current world wide crisis is a Schumpeterian event which may, under favourable conditions, set free a significant amount of productive human and financial resources. At the same time, the crisis affects the incentives for R&D investment. Indeed, a recent literature has evolved which argues that uncertainty related to macroeconomic volatility has lasting effects on innovation and growth (for an overview, see Loayza et al. 2007). Two main interrelated transmission channels can be distinguished – exchange rates and exports.

In a Schumpeterian growth model it is possible to show that uncertainty due to exchange rate volatility reduces innovative activity (Aghion et al. 2006). Basically, entrepreneurs in

[11] The Commission justifies its preference for a "horizontal approach" with the difficulty of defining individual business models in a precise and legally robust way and with the opportunities for regulatory circumvention that any such definitions would create (European Commission 2009b: 5).

open economies faced with uncertain world market price due to exchange rate uncertainty reduce long-run risky investments such as in R&D because they loose more with falling prices than they may gain with rising prices because of increasing costs of production. This negative effect of exchange rate volatility might be mitigated by a well developed capital market which allows for hedging these risks. However, as argued above, the capacity of the financial system for smoothing R&D investment is undermined by the economic crisis or critically depends on appropriate regulation.

Moreover, exchange rate volatility and, therefore, uncertainty of exchange rate changes also affect economic growth via the trade channel. With increased competition among firms operating in monopolistic markets across countries, the uncertainty of exchange rates drives a wedge between the values of revenues earned by firms located in different markets. Hence, in the short run, stability of exchange rates is crucial to export oriented firms as they affect their profitability. Fluctuations in the exchange rates impact on the export oriented firms' real decisions in three ways.

As already argued by more traditional models, innovation and exports influence each other (see, e.g., Lachenmaier and Wößmann (2006). Endogenous growth models recognize open-economy effects by endogenizing the rate of innovation and predicting dynamic effects of international trade on innovative activity. Product cycle models assume that developed countries export innovative goods and have to keep up their exports by continuous innovation. Hence, the more they innovate the larger are their exports.

An empirical test of these arguments with panel data for OECD countries comes to the following conclusions (Mahagaonkar et al. 2009):

- Innovative activity in the manufacturing sector depends on openness and, more specifically, on the export performance of an economy or the export orientation of a sector *and* vice versa; the higher export intensity the higher is innovation activity.
- Innovation as well as export performance in manufacturing also depends on macro-economic volatility as measured by exchange rate volatility; the lower real exchange rate volatility, the higher innovation and export activity.

What are the implications of these findings for the impact of the economic crisis on innovative activity? Looking at the current situation and short-run forecasts (Figure 6), the U.S. and Germany are much more affected by declining export shares than by exchange rate fluctuations. The Euro-Dollar exchange rate is rather stable reflecting the homogenous nature of the shock. Export shares plumped in 2009 in both countries but volatility of export shares in GDP is much higher in the export dependent German economy and return to normality is expected much faster in the U.S. than in Germany.

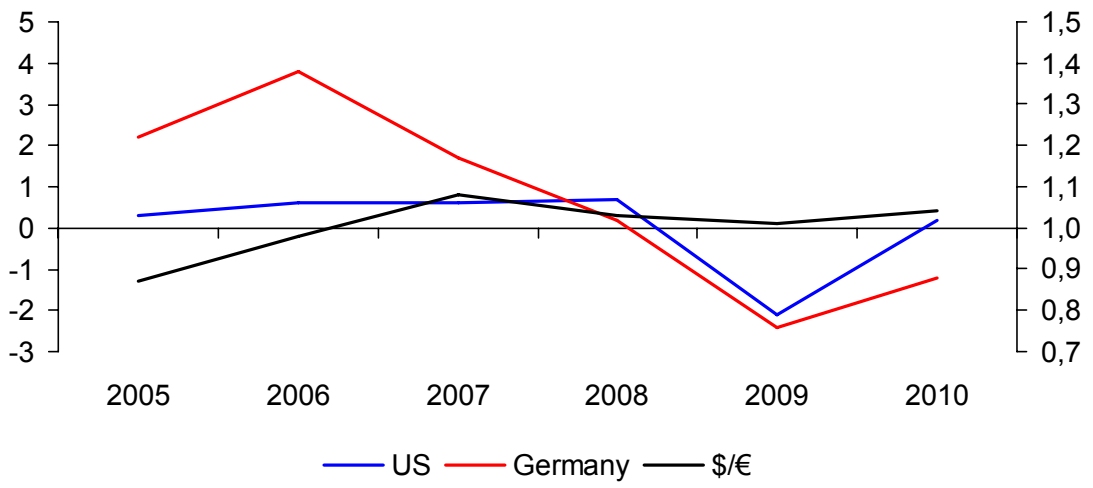

Figure 6: Export Shares (year-on-year changes; percentage points of GDP; left scale) and Exchange Rate (2004 = 1; right scale) for the U.S. and Germany, 2005–2010. *Source:* EIU (2009); own calculations.

The fact that the Euro-Dollar exchange rate is expected to stay rather stable in the near future does not exclude major uncertainties leading to expectations of rising volatility. Looking at quarterly data for GDP indicates that the downturn in the U.S. already attenuated in the second quarter of 2009 while the other OECD countries still faced a deepening of the recession (IfW 2009). To the extend that trajectories out of the crisis differ between major countries, exchange rates between these countries may become more volatile than during the initial shock period. Adding to this, oil prices are even more difficult to predict than before the crisis, the shapes of national and international financial markets after the crisis are largely unknown, and the massive injections of liquidity may or may not lead to an inflationary scenario. Hence, compared to the pre-crisis situation, macroeconomic uncertainties clearly increased.

In the end, innovative activity depends on the impact of the crisis on expectations about future volatility of exchange rates and export shares. It is reasonable to assume that the German economy is much more sensitive to these expectations. Export dependence implies that a depressed level of export activity might influence decisions on R&D investment negatively. Protectionist trade policies as a reaction to the export crisis as well as lack of finance for innovative SMEs due to inappropriate national regulation would increase the likelihood of such a negative scenario.

V. Conclusions

The growth of the financial industry in the U.S., the country of origin of the current financial crisis, during recent years has contributed to opinions that this industry has grown oversize, and that it must shrink back to “normal” size. President Barack Obama argues that “… Wall Street will remain a big, important part of our economy, just as it was in the ’70s and the ’80s.

It just won't be half of our economy. And that means that more talent, more resources will be going to other sectors of the economy. And I actually think that's healthy." (New York Times Magazine, April 28, 2009). Is Obama right? Can the U.S. expect a higher growth dynamics after the crisis due to better allocation of human capital? And does this – if true for the U.S. – also apply to (continental) Europe?

In this paper we have argued that the answer – for the U.S. as well as for Europe – depends on three critical factors: The supply of entrepreneurial talent from the banking sector, the availability of finance for emerging firms and the more general macroeconomic environment. A core result of our analysis is that there are marked differences between the U.S. and (continental) Europe with respect to all three critical factors.

There is empirical evidence for overbanking in the U.S. In the years before the current crisis, both the value added share of the financial industry as well as the wages of financial sector employees (particularly of the high skilled) have grown stronger than what could be explained by the growth and the increasing complexity of the financing needs of the real (non-financial) sectors of the economy. Hence, expectations that the supply of high skilled entrepreneurial talent to the real sectors of the economy will rise may be justified for the U.S. Although the current crisis has also narrowed the playing field for venture capital and equity finance in the short run this should not pose a serious problem in the longer run: Significant deregulations of the U.S. financial sector in the 1980 and 1990 have put the sector in a position to supply young, innovative and fast growth firms effectively with the financial services they need. Moreover, the U.S. economy is less sensitive to expected exchange rate volatility and export fluctuations, such that the macroeconomic environment for innovation is less affected by the crisis in the U.S. than in Europe.

In continental Europe (Germany and France, in particular) there is no corresponding evidence for overbanking. While this suggests that the need for the financial industry and its wages to shrink is less pronounced in continental Europe than in the U.S. or the UK, less overbanking also implies that fewer bright minds have been misallocated so far, and fewer gains can be expected from re-allocating them to socially more beneficial, possibly innovative or entrepreneurial, activities in other industries in the future. What makes things even more complicated is that in much of continental Europe those parts of the financial sector that supply young, innovative firms with the financial services they need for a fast growth have traditionally been underrepresented, compared to the U.S. And there is a real danger that inappropriate regulation of alternative investment funds at the EU level may even aggravate the financing problems of young/emerging firms in (continental) Europe and further aggravate Europe's growth problem (relative to the U.S.).

In a nutshell: There are marked structural differences between continental Europe and the U.S., such that the prospects for a socially beneficial re-allocation of human capital and a resurrection of economic growth after the crisis appear much better in the U.S. than in continental Europe. As a corollary, structural differences between continental Europe and the U.S. require different policy responses to the crisis, in particular in the area of financial market regulation. In re-regulating the financial sector in Europe particular care should be given to the venture capital and private equity sector. A regulatory approach that does not

appropriately differentiate private equity funds from other funds and the introduction of prohibitively large capital requirements on private equity providers could well lead to a choking off in the supply of private equity, which is desperately needed to bring Europe back on a higher growth path.

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