Innovation and Adaptability in a Digital Era: How Wealthy Nations Stay Wealthy©[1]

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The challenge for the advanced countries is to stay wealthy in a rapidly evolving and ever more competitive global economy. As a new digital era emerges and the mechanisms of value creation – i.e. the engines of productivity and growth – change in volatile marketplaces, wealthy nations have to find new ways to adapt. Particularly in Europe, successful adjustment has often been posed as a choice between social protection and market flexibility. In this paper, we recast this all too common framing and emphasize instead that competitive advantage for the advanced countries may be built through appropriate social policy. Upon clarifying the character of competition in the emerging digital era, we argue that the long-standing strong social protection systems particularly in many European countries could be leveraged to these countries' unique advantage in the emerging digital era. With such benefits as promoting social peace and assisting people in meeting new labour market demands, social protection systems have an important role to play in helping societies reorganize existing economic structures in support of successful adaptation to new competitive conditions.[1]

The first section situates the current dynamics and choices of the digital era by briefly tracing the evolution of historical production paradigms, highlighting for each the relationships between technology, business problems, and the resulting domestic and international politics. The second section then delineates a newly emerging digital production paradigm and elaborates the accompanying theory of value creation. Driven by the application of distinctive digital tools, firms' internal functions increasingly become products to be bought in the market, products that generated premium prices are turned into commodities, and the sources of differentiation for products, services and their production processes evolve.

The third section moves from a focus on corporate adaptation to a discussion of the state's role in the digital economy. Against conventional arguments that market flexibility requires the reduction of social protections, we argue that properly organized social protections facilitate market adjustment. Rather than conceiving of a trade-off between social protections and economic growth, we probe the purposes and operations of those protections. We make use of the Danish case as a proof point to demonstrate how European traditions of social protection can be consistent with the social and labour market flexibility required for successful adaptation to the new market environment. In Denmark, the configuration of social protection encourages the population to be open to change, promotes individual skill enhancement and collective social learning, and makes possible innovations in social organization. A final section reflects on the lessons of the Danish experience for other European countries' attempts to meet the challenges of the digital era. Lessons about social protection are relevant not only for the 'coordinated' economies of Continental Europe, but they apply more widely, even to distinctly 'liberal' countries. Appropriate social protections can (and have) become important parts of negotiated economic reform packages in a great variety of institutional settings.[2]

Section 1: Evolving Models of Production and Competition[3]

Every historical era of value creation involves distinct business problems, a changing role of the 'international' in the dynamics of the national economy, and new patterns of state involvement in the economy. The next section will describe these shifting variables in the phases leading up to the digital era. During this discussion, keep in mind that the three variables above are not independent, but actively move and shape each other in an ongoing process. The second issue, the relationship between technology

and the production and distribution of goods and services, will complement this chronology, serving as a guide to shifts between periods.

1.1 American dominance: Fordism and mass manufacture

Fordism, as it came to be called, was capitalism in one country. In the United States, it combined mass production with Keynesian demand management. Mass production, epitomized by Henry Ford and the Model T, was the first twentieth century production revolution, though its roots lie earlier in the 19th century. In this system, large-scale manufacture implied rigidity. Fixed costs in the production line and design were high; consequently changes in products or reductions in volume were difficult and expensive. Important features include a) the separation of conception from execution – managers design systems, which are operated by workers in rigidly defined roles that match them to machine function; b) the 'push' of products through these systems and into the market; c) large-scale integrated corporations, whose size and market dominance reflect mass manufactures' economies of scale.[4] While the scale of mass production created scale efficiency advantages, the rigidity of the production system created political, not just technical, problems.

Drops in demand were difficult to absorb for companies structured according to Fordist principles, leaving the national economy rigid as well. An initial downturn in demand could cumulate into sharper economic downturns. Booms and busts implied worker dislocations, and the national economic policy counterpart of the corporate business cycle management task became the political debate about how to use public policy to cushion not only the economic dislocations but also the political dislocations associated with mass unemployment. Domestic demand management policies, associated

with the label of Keynesianism, were born. They were expanded in the Bretton Woods era, when an international fixed exchange-rate regime and economic growth rates in excess of long-term interest rates made them highly efficacious.

1.2 Challenges from lean production and flexible specialization

Challenges to American manufacturing came from two directions. The more important challenge was the interconnected set of Japanese production innovations, loosely called *flexible volume production* or *lean production*.[5] The Japanese lean production system seemed to allow for rapid market response by providing both the flexibility to adjust output in existing lines as well as introducing new products.[6] If the political story of Fordism highlights national strategies for demand management, the Japanese story of lean production highlights the role of a 'developmental' state and the interaction among the markets and producers of the advanced countries in international competition.[7] The Japanese state actively promoted domestic development with closed markets at home, while 'free-riding' on the international system to use exports for stabilizing the domestic economy. The combination of an open international system with intense but controlled competition behind managed trade borders proved decisive in the emergence of the innovative and distinctive Japanese system of lean flexible volume production.[8]

The second challenge to the classical American mass production model came from Europe under such labels as *diversified quality production* and *flexible specialization* at about the same time.[9] Typified by the 'Third Italy' and Germany's Baden-Württemberg, these versions of craft production survived and prospered in the late twentieth century. The particular political economy of the two countries gave rise to

distinctive patterns of company and community strategies. Deploying flexible machinery and relying on skilled workforces rather than on paying low wages, firms in these countries often competed in global markets on the basis of quality rather than price and on their ability to produce short runs of semi-custom goods. Flexible regional networks and within-firm structures allowed them to more effectively adapt to the radical uncertainties and discontinuities of global market competition than larger, more rigidly organized companies. The emphases in these European production models are the *horizontal connections,* the connections within the community or region of peers, as distinct from the *vertical or hierarchical connections* of the dominant Japanese companies. The flexible specialization model hinges on local institutions, such as chambers of commerce, vocational training systems and public research facilities, which permit the continuous combination and recombination of local activities. Thus, the two innovative challenges to American production dominance each featured distinct roles for policy and the state.

1.3 The transition to a digital age and the American comeback: Wintelism and Cross National Production Networks

The first chapter of the digital era can be best characterized by the emergence of *Wintelism* and *Cross-National Production Networks (CNPNs).*[10] The term *Wintelism* reflects the sudden rise in importance of constituent elements and components in defining the terms of competition in the markets for the final products. This translated into a consequent strategic shift in competition away from the vertical control of production by final assemblers. *Cross-National Production Networks* was the label first applied to the consequent disintegration of the industry's value chain into constituent functions that can

be contracted out to independent producers wherever those companies are located in the global economy, further accelerating the global division of labour. The networks permit firms to weave together the constituent elements of the value-chain into new production systems that facilitate diverse points of innovation. They also turned large segments of complex manufacturing into a commodity available in the market.

Wintelism emerged as a strategic response by American producers to the Japanese production challenge during the 1980s and involved both new terms of competition and a new model of production. For the first time, producers from different nodes in the value chains competed over control of the evolution of technology and final markets. Even component companies succeeded in shaping market segments. Most importantly, Wintelist competition tends to be a struggle over the setting and evolution of de facto product market standards. Components and subsystems are built to generally agreed standards that emerged in the marketplace, and open – but owned – standards create de facto intellectual property (IP)-based monopolies or dominant positions. Additionally, as portions of the value chain can be broken into modules, the production/manufacturing of any system with clearly defined components and subsystems can be outsourced.

Politically, the Wintelist era was marked by domestic deregulation, especially in the United States, and American-led international agreements that created an ever more open international trade system. In addition to deregulation, American markets also shifted competition and market leverage toward component makers. These initially domestic phenomena eventually reshaped the electronics industries worldwide. Ever more extensive and dispersed networks of investment, trade, and production were the first

step in an evolution of complex global production networks and supply chain management.

1.4 ‘Globalisation with borders’ and era of digital services

The classic version of the globalisation story stresses how the internationalisation of business – enabled by lower ‘transaction costs’ associated with technological change – has severely constrained active government policy. In contrast, the evolution of production paradigms sketched out above suggests a different take on globalisation. Each production model’s power in international competition rested on its national basis and/or explicit government action. From this alternate vantage, globalisation is a story of national innovations played out on a larger stage. A sequence of new competitors, new and often unexpected loci of innovation and production, bring new processes, products and business models to the international marketplace. It is a ‘globalisation with borders’.[11]

Between the historical periods described above, there has been a constant reshuffling among products, commodities, and differentiated assets, which in turn has changed business models, domestic, and international politics. Globalisation only accelerates the reshuffling, and digital tools often are the means of accomplishing the reshuffle. In the *Wintelist* era, production increasingly became a commodity. Manufacturing firms went offshore for cost reasons or to have access to local markets, but discovered abroad a widely distributed capacity for technical and management innovation. Outsourcing led to cross-national production networks and eventually skills of supply chain management, each step making the next phase of outsourcing, i.e. the commodification of production, easier.

This brings us to the beginning of the digital era. As was true in earlier periods, dramatic marketplace developments are cooking inside of firms and in (inter)national systems of innovation and competition, largely unobserved by the outside. If Microsoft's Windows product was a champion of *Wintelism*, Google's online services may be an early champion of the digital era.

What is new about the digital era is the range of activities eligible for such a reshuffling, as the digital era expands modularization beyond physical processes. This opens up new challenges, in particular because services are deeply rooted in social processes. Moving service task might run into stronger social constraints than was the case with many manufacturing processes. In either case, it may be technically easier for services to move offshore today than it was for manufacturers to do so twenty years ago. The required tool set of computers, software, and communications is available in the market and easily transported. How far will this geographic dispersion go? Can all activities be placed just anywhere? Is there any geographic stickiness to production or services?

In developing frameworks for answers to these questions, we will acknowledge the digital tools at the root of this unbundling and expand on what this decomposition of tasks means for business models, the provision of services and internal corporate organization. More importantly, we will define the key components of value creation in the new digital era and thus lay the foundation for the subsequent discussion of how policymakers can promote competitiveness in a digital global environment.

Section 2: Value Creation in a Digital Era[12]

The current phase of the digital era is associated with a new set of distinctive tools, tools for thought. These tools amplify brainpower by manipulating, organizing, transmitting, and storing information in the way the technologies of the Industrial Revolution amplified muscle power.[13] The tool set rests on a conception of information as something that can be expressed in binary form, open to subsequent manipulation.[14] It consists of the hardware that executes the processing instructions and the software, i.e. the written programmes defining the procedures and rules, that guide how the hardware equipment's information processing. In addition, it includes the data networks that interlink the processing nodes, and the network of networks, which together create a digital community and society.

These tools facilitate two interlinked significant economic transformations that are changing the logic of value creation in the global economy: the modularization and unbundling of corporate activity and the algorithmic revolution of services. Combined with the increasing knowledge requirements of the digital era, these shifts demand new corporate strategies, new organizations, and ultimately, new policies.

2.1 Modularization and unbundling: products, commodities, and differentiated assets

To understand the changing logic of value creation we begin by pondering three familiar notions: products, commodities, and differentiated assets. A *product*, whether object or service, is an item that can be bought and sold in the market. A *commodity* is a good or service that is exchanged in competitive markets with little advantage to any particular buyer or seller. A product becomes a commodity when it is generally available

from a number of suppliers on common terms in the market. Finally, a *differentiated asset* creates the basis for premium price, distinctive sales advantage, or cost advantage in production or distribution.

Consider some of the implications of modularization. Production becomes a product to be purchased in the marketplace through contract manufacturers or outsourcers. Even R & D, development and innovation, and internal competitive differentiators become commodities. With the explosion in total knowledge, firms cannot be at the cutting edge in all technology developments that affect them, and must become technology integrators who look outside the firm for portions of production.[15] Firms are buying R & D from universities and start-ups, or they are sourcing from joint product development projects and technology development outposts.[16] Richard Baldwin sees in the rise of modularization a new paradigm for globalisation, stressing how a 'great 'unbundling' geographically pulls apart activities and locations in a powerful way.[17]

Extreme versions of the unbundling are found in radically new production systems, such as open source software development. The collaborative work arrangements it points to are both about production of software and made possible by the digital networks.[18] Open source as a principle of organization hinges on distinct approaches to mobilization and coordination of work, not a vague voluntarism but replicable rules of participation and gain. It rests on foundations that turn notions of property from ones of control of the use of an object, or an objectified body of code or knowledge, into control of the processes of distribution.

Firms have to decide, and continuously reassess, questions such as what elements of production and development are effectively high-end commodities, which technologies

are strategic assets best acquired, procured on an exclusive basis or developed in-house, and how to move to capture distinctive technological assets.[19]

Moreover, modularization of product and unbundling of activities create an array of product markets. Each subsystem, module, task, or component suddenly becomes a potential product in inter-firm and international trade.[20] Each modularized component of a product or unbundled function is a point of entry, and each point of entry creates an opportunity to mobilize resources, create market advantage, and generate retainable positions. As new competitors from diverse places enter the markets, competition in product markets intensifies, and more goods and services become commodities. The pace of change of change and innovation accelerates. This produces a constant reshuffling of what is produced within the corporation, what is outsourced, and what is located where.

A dominant feature of the digital era is the commodification of the whole array of products and components. This squeezes profits in many domains, generates market uncertainty and constantly changes the character and terms of business competition. The result is an urgent and constant drive by firms to find the 'sweet spot' in the value chain and in the market – the (at least momentarily) defensible point to capture distinctive advantage and profit.

It was long conventional to consider market competition within sectors – defined market segments with understandable sets of competitors, terms of market entry and competition. Now one hears talk of 'value domains'. The notion of 'value domain' points to the array of digital functions that can be embedded in a small chunk. For example, in one sense Canon's worst competitor is Nokia.[21] And Nokia, which can provide music on its cell phones, in turn faces competition from Apple's iPod. The bloc of electronics

encased in plastic can be a PDA, a phone, a camera, a music device, or a television, all 'value domains' in which the products, and their functionality and design, can be defined. Value domains are where companies must now seek to create differentiated assets. But how does one capture a value domain? Which functions will retain value and which will become commodities?

Digital tools and information products change the task of creating unique or differentiated goods with premium prices, or generating products for which consumers will pay a premium. Digital tools give firms new ways to identify who will pay how much for what, allowing them to better match offerings to the demand functions of ever smaller groups of consumers and then create products or give functionality to commodity products that people are willing to pay for. Analytic tools and database management permit new segmentation strategies that create value by targeting markets smaller and more unique than ever before. Firms can segment consumers into sub-components, each with distinct needs and wishes. Firms attack these specific segments with distinctively branded, products; classical strategies of activities such as branding and design will remain critical for differentiation. Collecting detailed information about customers as groups or individuals in a variety of forms, credit cards or grocery store purchases through loyalty cards are obviously very important to companies having chosen this particular strategy.[22]

Think for a minute about how digitally rooted online sales/marketing and supply chain management alter the links between a firm and its customers as well as suppliers. The Dell story tells how innovative uses of the net that tie customers from sales through production can create dramatic advantage.[23] Furthermore, as development and production

processes are woven together to speed up the time to market and improve design choices, the lines between production, design, and development blur even further. Again, this happens not only in products, but in traditional service industries as well. For example, retail trade, an industry that has changed little over the centuries, has been dramatically transformed as digital tools allow firms to offer new services in a way never before possible, both through in firm restructuring and interactions with the customer. Over the past ten years, a new model of 'lean-retailing' has begun to loom over its global competitors. The industry leader, Wal-Mart, has built a global empire by efficiently applying digital tools throughout its organization to connect suppliers to customers in unheard of ways. Through Wal-Mart's Retail Link system, suppliers now know what customers are purchasing in near real-time, allowing considerable advantages for firms with the flexibility to respond to changes in consumer demand.

Once the market segments are defined, digital tools may then also help firms create functional variety in products. Early on, the insurance industry moved from using computers exclusively for back office operations to using them to create customized products for particular consumers.[24] Standard products can be given diverse functionality. The coffee maker that automatically turns on at a particular time in the morning depends on simple digital functionality. The difference between many higher speed, higher price, printers and their slower, lower price, brethren is in the software that tells the printer how to operate.[25] Firms have new ways to identify who will pay how much for what, and then create products or give functionality to commodity products that people are willing to pay for.

2.2 Services: The fourth algorithmic revolution

Modularization is just the beginning of the story, a story that includes the services transformation. Firms began to outsource and offshore not only manufacturing activities, but also internal services tasks, ranging from low-level accounting, to high-level R&D. The commodification of particular goods and service activities accelerates the increasing pressure to innovation in products, processes, and firm-level organization. Consequently, the competitive struggle increasingly becomes a search for distinctive advantages in the shifting 'sweet spot'. Repositioning around services becomes part of that search for both this defensible position in the value chain and the capabilities to sustain this position through innovation.[26]

The services story, the algorithmic transformation, has several dimensions. The relevant aspect for our discussion is that when transformed digitally, services become central to strategy as an antidote for or a response to commodified production, whether those products are manufactured goods or software. Product companies, such as IBM, that had embedded services in their product offerings begin offering services with hardware embedded. The IBM story points to the blurring of the distinction between services and products in a digital era, a distinction that has never been very clear. However, now the blurred line between product and service becomes a matter of strategic importance. Consider accounting: Accounting is a personal service provided by accountants utilizing tools from the original double-entry bookkeeping system to computers. But if you create a digital accounting program and put it on a CD, put it in a box, call it Quicken, and allow its unlimited use by the purchaser, then you have a product. If you put the program on the Web for access with support for use on a fee basis,

then you likely offer a service.[27] There is a strategic significance well beyond the blurring itself. Apple's iPod sells a music service not just a device; Finland's elevator/crane company (Kone) repositions itself as providing 'elevation' services rather than merely producing elevators and cranes, or a Chilean mining company offers IT-enabled remote mining services.[28]

Looking more generally, service activities are changed when they can be converted into formalizable, codifiable, computable processes – processes often with clearly defined rules, algorithms – for their execution. Services, thus unbundled into modules and activities, become tradable and footloose. As a result of this algorithmic services transformation, services, once considered an economic sinkhole, are seen as a source of growth and productivity. What we call the services transformation is not about the growth in quantity or value of activities we label services. Rather, it is the transformation of service activities, resulting from the application of rule-based Information Technology, which alters how these activities are conducted and value is created.

The consequences are pervasive. At the firm and industry level, business processes, from finance and accounting through customer support and CRM, are altered when they can be treated as matters of information and data management. Routine and manual functions are automated, enabling a fundamental reorganization of activities. Likewise, sensors and sensor-based networks change many personal services – such as home care becoming a monitored distance activity – requiring a corresponding shift in skills.

Returning to modularization, we find that the algorithmic transformation of services permits the unbundling of service activities, facilitating outsourcing and the easy relocation of activities. Firms acquire capabilities outside the firm, or seek cost, speed, or process advantage through outsourcing. This reorganization of service provision represents a new division of labour within the firm; old tasks become automated, usually requiring workers to take on new tasks and develop new skills.

2.3 Knowledge and organization in the digital economy

Finally, the shifting character of value creation in a digital era is captured by considering the problem of knowledge and information. Knowledge, particularly theoretical knowledge, has been recognized as an essential element of the contemporary economy. Beyond being valuable as an expression of information, the digitization of knowledge opens boundless possibilities for the application of digital tools for thought. In a digital form information can be formalized, stored, searched, transmitted, and used to control the operations of physical processes.[29] We can put the catalogue of the Library of Congress onto a single digital memory stick and transmit it around the globe. The complex relationships on which engines operate or planes fly can be stated as algorithms, represented in digital form. The flood of data made possible by these tools can drown the recipient. How do we know in an avalanche of facts and stated relationships which ones we care about? Oddly, the same 'tools for thought' make easier the creation of meaningful information and the generation of knowledge from the flood of digital data.

Codified knowledge, whether stored digitally or embedded in equipment, requires context in order to be useful. In a digital era, this necessitates experiments with knowledge management to force open the very fundamental question of what knowledge

is. According to Nielsen and Nielsen, knowledge unfolds in the iterative processes between tacit and codified forms, and optimizing knowledge in organizations is essentially an issue of optimizing these iterative processes.[30]

There is an organizational implication of this consideration of the nature of knowledge. Internally, the company organizations required for most efficient manufacturing might not be the same as those required for effective exploitation of knowledge. In the 1980s, the Japanese innovations of flexible volume production using lean, just-in-time techniques created a distinctive production advantage and rocked market competition. Is there a similar revolution afoot now? Lorenz and Valeyre claim to have identified a new 'learning' model of corporate organization that significantly departs from traditional craft organization, taylorist organization and lean production systems; particularly, they see this distinctive organizational form emerging in Northern Europe, principally the Nordic countries.[31] In the case study on Denmark, we will both explore this new organization form and the political-social environment that supports it.

2.4 Implications

Every era contains a certain level of uncertainty and risk. What is distinctive about the digital era is the pervasive and continuous uncertainty, as new and established players use evolving technological tools to create and rapidly obliterate opportunities for unique value. This shifting sweet spot creates an ongoing and urgent need for companies' flexibility and adaptability. In general, we need to fundamentally rethink how firms organize their activities, how international markets work, and what governments can do to promote growth and create sustainable advantage.[32]

The question is then why do some companies, and more importantly societies, make better bets or more effectively conduct the process of experimentation and evaluation that must carry them into the future? What are the social and political rules that might facilitate this process and create a resource base conducive for success? In the next section, we will argue that the ability to effectively read the market, quickly develop new strategies, and turn these strategies into deliverable products rests in national economic environments. In short, nations can build firm competencies in innovation, flexibility, and planning.

The tasks for states are not easy ones. To manoeuvre successfully in an environment of constantly shifting advantages and under pressure to rapidly create differentiated assets, they need to be able to both sustain individual and collective learning processes and implement the business, social and technological innovations generated by these processes.[33] So what resources should the state furnish to encourage workers and firms alike to push the boundaries of their economic offerings?[34] Traditional offerings will need to continue from the industrial era, such as providing a skilled workforce, centres of technology development, or the state's conventional role in providing economic infrastructure and the institutions of the marketplace[35]. In a digital world, however, what may be most important is a balance of both flexibility and social protection, two concepts that many observers mistakenly view as at odds. With that in mind, not only can states help show companies where to place their bets, they can give society the nerves to let them do so.

Section 3: Leveraging Social Protection for National Adjustment

But what about places? The ever-evolving marketplace of the digital era requires companies to frequently re-cast themselves: what they produce, which markets they address, how they produce and deliver the good or service, how they are organized, and indeed, with more difficulty, whom they employ and where they employ them. The flexibility to move and to move quickly is key, but that puts great pressure on communities and polities. There is no doubt that flexibility will be essential for future success. However, the question remains how best to achieve it.

The liberal position assumes that social protections act as rigidities that hinder the efficient functioning of market-led adaptation. Indeed, by virtue of posing a choice between protection and adaptation, liberal reasoning has to come out against protection. According to the liberal position, cutting welfare state programs and reducing the perceived monopoly power of trade unions is the way to increase nations' social and labour market flexibility in preparation for new challenges.[36] In our view, such simplicity is wrong. We consciously reject this framing, a view which became very popular after the end of the Cold War and seemed supported by both the tenor of 'expert' opinion (such as the 1994 OECD Jobs Study) and – not least – the apparent success of Margaret Thatcher's success in 'getting Britain back to work'.

The current evidence convinces us that there is another way, one that is not only more equitable but – importantly – also seems to deliver benefits for societies and companies, which promise to constitute comparative advantages in the digital era. In the digital era, social policy provides a necessary counterpart to corporate adaptation. Why? Let us start with a broad definition of how a community, country, or region can succeed

in global competition. *The competitiveness of a location is the degree to which it can, under free and fair market conditions, produce goods and services that meet the test of international markets while simultaneously expanding the real incomes of its citizens.*[37]

In this section, we argue that national social protection systems can underwrite this competitiveness, facilitating both corporate experimentation and frequent re-organization. We will present our argument of how social policy can support adaptation to the emerging digital era in three steps. We start by reviewing the essential role that social protections have historically played for the efficient functioning of labour markets, facilitating structural change und supporting production strategies. Subsequently, we turn our focus to the record of Danish adjustment over the last two decades. We present the Danish case as a proof point of how social protections can be consistent with – and better still facilitate – the social and labour market flexibility required in the digital era. In a final step, we acknowledge that national social protection systems are not created equal, and many will need to be reformed to facilitate economic changes as well as the Danish arrangements have done.

3.1 Social protection and market performance

A long lineage of political economy research, an important complement to analyses in mainstream economics, has emphasized that real-world markets are always socially and political embedded. Indeed, according to political economy scholars, efficient market functioning crucially depends on appropriate institutional intermediation.[38] In turn, these scholars have included institutions and social forces in their analyses. We follow this tradition. In turn, rather than calling for removing the rigidities of social protections as the liberals do, we intend to focus on the real policy

challenge: to find the most ‘flexible rigidities’ that can supply the right balance between flexibility and protection.[39]

The political economy approach is particularly relevant for understanding the performance of labour markets. Given labour’s social, personal and physical embeddedness, there exists no ‘perfect’, non-intermediated labour market. Labour’s unique features include 1) a perverse backward-bending supply function, 2) the highly ‘differentiated’ nature of the commodity based on people’s different skill endowments, and 3) the active collaboration required of the seller of labour.[40] These properties reduce the scope for using simple, parsimonious and institution-free economic models to help us understand labour market adjustment.[41]

So how should we go about analyzing labour markets with social and institutional factors in mind? Let us briefly review how non-market elements such as social protection and collective action by workers increase both the efficiency of labour markets and ultimately provide them with their necessary legitimacy. First, as for all markets, labour allocation needs rules and limits to sustain continued competition as unfettered competition may destroy the market. Moreover, workers have no incentive to invest in skills that are specific to firms or particular economic sectors without unemployment insurance protection reducing the risks associated with such skill investments.[42]

The legitimacy dimension is just as – if not more – important. Polanyi famously argued that the establishment of a viable labour market required more than merely commodifying labour; in what he referred to as a ‘second movement’, he called for creating mechanisms to shelter workers from the social dislocations associated with market rule, so that workers would accept market rule itself.[43] Social protections

legitimize the deployment of market mechanisms, facilitate resource transfers and thus increased the flexibility of business in the economy. At the same time, they support market adjustment through securing social peace – by compensating the losers of economic change – and encouraging broad sections of the population to adapt to changing environments.

History has amply demonstrated the importance of social protections in reducing the conflict between the effects of market rule and the social and physical needs of workers. During industrialization, in the 'satanic mills', the early capitalists were still able to ensure workers' active collaboration through promoting ruinous Hobbesian competition between workers.[44] However, the limits of such strategies became clear in the social upheavals that ensued.

The welfare state is not the only mechanism of social compensation that can be used to provide market adaptation. Consider the system of agricultural protections – the 'Common Agricultural Policy' (CAP) – that the European Union maintains to this day. This policy might be expensive to the consumer, but it also performed an important role in facilitating sectoral changes throughout much of Europe and, particularly, in France, a country in which agriculture was still the economy's largest sector after the Second World War. Since then, Europe's once agriculture-based economies became industrial powerhouses and are now increasingly dominated by services. Each phase of development and modernization has been associated with social transformations, which – in turn – have been supported by social protections. In many cases, economic development is facilitated by a mix of compensations that ease market processes.

As briefly surveyed in this article's first section on the 'evolving models of production and competition', social protections have facilitated the successes of quite different production paradigms. For example, remember that the success of *Fordism* required Keynesian policy buffers to offset systemic political and production rigidity. Later, the interplay between production and protection was quite different for the production paradigm of *diversified quality production*. Here, union rights and workers' social protections functioned as 'beneficial constraints' on managers' actions.[45] Managers had to devise corporate strategies that were not only competitive in the market, but also allowed them to get worker support and cope with high labour costs. Given these constraints, many German companies chose to production strategies that emphasized the products' quality and could thus evade price competition.

Over the last two decades, the competitive environment has radically changed, and the digital era poses a new set of political and production challenges. At the same time, the basic historical lesson – that social protections can facilitate the workings of the market – continues to hold. In the digital era, firms face a much higher level of continuous uncertainty than it was the case in previous eras. In turn, firms' success in the new environment is predicated on being able to react flexibly, which itself is dependent on access to mobile workers with up-to-date skills and the ability to work autonomously. Importantly, workers' social protection programmes can play a key role in supporting companies' competitiveness by providing them with these resources. To demonstrate how, we will now turn to the Danish case.

3.2 ‘Flexicurity’ and Danish performance

We invoke the country as a case of national innovation in a globalizing world in which borders continue to matter. Denmark has over the last two decades successfully leveraged its social protection system to support socio-economic innovations, which – in our view – seem very much like a *flexible specialization* model updated for the digital era. During the last few years, Danish social protection and labour market institutions have become widely recognized as supporting a system of ‘flexicurity’, i.e. one that combines the promotion of labour market flexibility with the provision of social security. Having bolstered social flexibility and business competitiveness while securing political stability, these institutions have been identified as sustaining the country’s ‘institutional competitiveness’.[46] To underscore the point, let us mention that the Economist Intelligence Unit recently declared Denmark as the best place in the world to conduct business over the next five years, and the World Economic Forum scored it at fourth place in its growth competitiveness index for 2005.[47]

Denmark’s high labour market and social flexibility can be tracked on a variety of measures. First, in Denmark, job mobility is very high, with Danish levels matching those of the United States and Britain; the median job tenure in Denmark is a relatively short 4.4 years, compared to 10.7 years in Germany and 7.8 years in Sweden.[48] Every year, an average of 10 percent of total jobs is created or destroyed, and roughly one third of the entire labour force is newly recruited or dismissed. At the same time, Denmark’s labour market participation is among the highest and long-term unemployment among the lowest in Europe.[49] For example, in 2004, long-term unemployment of more than 12 months in Denmark was half the level of the EU 15 (22.6 per cent compared with 42.4

per cent).[50] Finally, the Danish population displays a strong general openness to change. When asked, if globalisation was a threat or an opportunity, the Danish population was the most open to globalisation in Europe. Among the Danes, 77 per cent saw globalisation as an opportunity versus only 16 per cent seeing it as a threat. This sharply – and positively – contrasts with the results in Britain and Germany, where the numbers were 45 versus 38 per cent and 34 versus 59 per cent respectively.[51]

There is no doubt that Denmark's social protection system plays a key role in sustaining these outcomes, in particular, if we acknowledge the integration of the Denmark's training system into its structures of social protection in our analysis.[52] Denmark has a unique system of 'protected mobility'.[53] In contrast to many other European countries, Denmark grants little protection *against* unemployment through statutory rules preventing worker lay-offs. Instead, the country offers social protection in a different way by providing protection *during* unemployment and promoting chances for workers to increase their *employability*. More precisely, the Danish system supplies very generous unemployment benefits, administered through active case management and tied to training opportunities for the unemployed. Thus, importantly, not only does the Danish welfare state cushion to losers of economic change, it rearms them with the skills needed to return to the market and be successful. This is increasingly vital in an era with a growing premium placed on skill sets.

Let us elaborate briefly on the mechanisms of the system. Unemployment benefits replace up to 80 per cent of an unemployed person's former wage. This allows individuals to search for the most suitable job rather than having to take the first available one for lack of personal financial liquidity. For those individuals who do not find new

employment within a limited period, unemployment benefits become conditional on the recipient participating in training measures.[54] Lower social assistance benefits are provided on the basis of citizenship rights.

In Denmark, the training measures for the unemployed are organizationally tied in with the continuing training (or lifelong learning) activities of the currently employed, improving their quality compared to the programs in other countries and reducing potential stigmas of participation. The important role of training as an 'active' and 'capacity-building' social policy is widely recognized. Indeed, it is an instrument used so intensively that Denmark is the undisputed leader in the provision of worker training in the OECD and the European Union. Danish workers spend more time in training and skill formation programs than workers in any other EU member state, and Denmark is the OECD country with the highest level of employment policy expenditures.[55]

Crucially, the Danish training programmes deliver the desired effects, with the active labour market policies putting workers into the position to connect with the market in ways impossible without public support. The Danish workforce excels in continuous up-skilling and re-skilling, in contrast to other countries, where vocational or university education is often largely (or even solely) provided at the beginning of workers' narrowly circumscribed careers. Additionally, lifelong learning activities are available to the entire Danish population, which combines the promotion of competitiveness with the encouragement of social cohesion. This is, again, in stark contrast to other countries. For example, in Germany, continuing training activities (usually within firms) are largely targeted to those workers who already have attained a high level of education. Finally, the Danish training system seems to do a very good job in teaching the skills needed by

companies in the digital era, such as the ability to independently acquire more knowledge, to engage in complex interpersonal communication and to autonomously develop solutions to encountered problems.[56] These skills are easily transferable on external labour markets and allow for higher functional flexibility in internal labour markets.[57]

These outcomes flow from the structure and financing instruments of the programmes. First, there is the high share of public funding for training programs. In addition to funding programmes for the unemployed, the state assumes much of the costs for the general-skills training courses for currently employed workers.[58] Second, there exists a lot of leeway for Danish companies to shape the programs to meet their local needs.

The benefits of the country's institutional system for Danish companies are myriad, expanding the available options for organizing their activities. Not only do companies have a high degree of freedom in employing, deploying and adjusting their labour forces, they also have ready access to a pool of workers with up-to-date skills and a general willingness to learn more. In comparison to their competitors, Danish firms can grant workers more autonomy, leaving them with more discretion for decision-making unconstrained by hierarchical supervision systems.[59] This provides the basis for very effective decentralized knowledge management within the firm, a fact backed up by Lorenz and Valeyre's recent analysis of comparative European data.[60] They find that a new corporate 'learning' model is more prevalent in countries with universalist systems of social protection.[61] Through tapping into individuals' knowledge to provide organizational flexibility, the learning model provides a good basis for experimental

corporate strategy.[62] By facilitating close collaborations between companies' customers, production workers, and engineers, it has made possible continuous experimentation in support of incremental innovation. The success of Danish companies in playing 'global games', be it as independent operators in niche markets or as valuable subsidiaries of multinational corporations, indicates the learning organization's strategic value.[63]

The success of Danish companies extends inward, beyond the labor market, to include the workplace as well. In 2007, The Great Place to Work Institute, an international consultancy, ranked Denmark near the top of European nations, in terms of the absolute number of companies it placed in the top "100 Best Workplaces in Europe".[64] This is no small accomplishment, given that the other leaders possess much larger populations and GDPs. Denmark has more than 60 times more companies in the rankings than France, per unit of GDP, and almost 8 times as many as the nation with the most firms on the list, Germany.[65] In addition, the vast majority of the Danish firms are homegrown, rather than American subsidiaries, which supports the notion that the Danish economy supports innovation at home.

With such results, Denmark clearly demonstrates the viability of combining economic modernization with European traditions of social protection.[66] Danish institutions provide workers with the security they need to act truly flexibly. This has successfully allowed for the Schumpeterian processes of creative destruction, which are so central to achieving economic growth and improving productivity in the digital era. Importantly, Denmark's performance is likely to continue, with recent policy studies predicting that Denmark will receive net gains from future offshore outsourcing on the

basis of its impressive re-employment rates for workers whose original jobs will be off-shored.[67]

3.3 Flexibility and social protection

Arguably, at this stage, few other countries come close to Denmark's inclusive system of 'protected individual mobility'.[68] Rather than providing 'protection for change', many countries' social protection systems are often still too much oriented to offering 'protection from change'. Integrated into their countries' economies in different ways, and resting on distinct political compromises, countries' social protection systems differ along many dimensions, such as who is protected, at what level and through which mechanisms.[69] For example, in Continental European countries such as Germany and France, social protection systems remain structured so as to protect the job-insiders with strict employment protection rules and shield the self-employed from competition.[70] Outsiders – while often recipients of public social assistance benefits – tend to remain unemployed with little chance of re-integration into the workforce.[71] Arguably, by locking workers into specific types of activities, such systems of social protection actually hinder the social adjustment necessary for the experimental economy.

Conceived in a pre-digital era and supporting older production strategies, many countries' social protection systems have often become dysfunctional, undermining rather than boosting current strategies of value creation. For example, the self-reinforcing cycles of highly-specific skill investment, which analysts claim to have identified in the interaction of social protection and economic production in Germany, can be highly beneficial; however, they can become a drag by undermining better offerings for more

general analytic skill training, which will be high in demand in the new era with its constantly shifting marketplace dynamics.[72]

It is clear that the incentives in some social protection systems need to be re-aligned to support the flexibility and learning that the new times demand. In particular, rather than simply providing workers with *job* protection, systems need to be reoriented to deliver true *employment* protection that assures workers' re-entry into the labour market. Most certainly, this will not be an easy process, and policy-makers will not be able to simply adopt Danish institutions.[73] Consider Japan and France. In Japan, social protection is often embedded in private employment structures. Consequently, firm failure is 'socially too expensive', leading to continued bank financing to prop up troubled companies. Achieving flexibility in the Japanese context would require unwinding the nexus of company/finance/social protection institutions.[74] In France, social protection is embedded in the defence of particular social and employment arrangements. Apart from the formal system of government financed social protections, the economy abounds with an array of 'acquired rights', situations that embed privileges from taxi licenses through café licenses to protection of job locations.[75] These job protections hinder market entry; at the same time, they do little to prepare workers for competition in the event of deregulation.

Most likely, reforms will not always have the desired effects. In Spain, the level of social protection and employment security had long greatly diverged between labour market insiders and a large number of outsiders, such as the unemployed and temporary workers. When, in 1984, the government tried to make it easier for firms to fire workers to redress this imbalance, these reforms ended up further increasing labour market

segmentation by reinforcing the bargaining power and wages of insiders while concentrating economic insecurities among a rising number of temporary workers.[76]

Predictable difficulties in adjusting social protection systems should – in our view – not be used as an excuse for not attempting to rise to the challenge. After all, a considerable pay-off might materialize upon finding a better balance between flexibility and protection. Individual countries have shown that reforms can succeed. Denmark itself is the best example. The country went through a deep institutional crisis in the 1980s, and many features of its 'active' labour market policy were only introduced during the 1990s and subsequent initiatives.[77]

Denmark's system of employment rather than job security, in combination with enhanced levels of external and internal flexibility could be taken as a best practice for Europe, as illustrated by our discussion of the Danish case and supported by a growing body of comparative literature on 'flexicurity'.[78] Comparative analysis has shown that lay-off protections are quite ineffective in promoting a high feeling of job security. Quite to the contrary, the Danish population – with a high number of workers experiencing unemployment and receiving benefits during any given year – reports a higher feeling of job security than is the case in all other OECD countries.[79]

Finally, the Danish case also proves that labour unions are not automatic supporters of job protections but rather can see the bigger picture. A strong force in a country, in which over 70 per cent of workers are their members, and collective bargaining has a very strong tradition, Danish labour unions now actively support the country's labour market regime built around low lay-off protection. They even extol its benefits to their members, doing so based on the recognition that easy firing often

translates into easy hiring, a fact all too often lost in the debate on flexibility versus protection.[80]

Section 4: Conclusion and Outlook for Europe

This essay makes two arguments. First, the competitive environment has really changed in the digital era. Countries and companies face an ever more volatile competitive marketplace. They have to manoeuvre in a competitive environment, in which the 'sweet spots' for corporate success are constantly changing as companies' internal functions become products, products become commodities, and the sources of differentiation for products and processes are constantly evolving. The new 'formula' for corporate success requires a social capacity for flexibility and adaptation.

Second, social protections can serve as essential sources of social capacity for adaptation and change. Importantly, how those protections are organized and delivered is as important as the level of protection. Continental European countries' 'dilemma' of providing 'welfare without work' is only one possible outcome that came about after a history of 'adjusting badly'.[81] To the contrary, as seen in the Danish case, European traditions of social protection can be the basis for continued growth and productivity in a competitive marketplace.

Our policy stance is that rather than always conceiving of social protections as 'politics against markets', we embrace a perspective that sees a genuine role for social protections as a 'politics for/of markets'.[82] We join fellow NPE-author Ian Gough in urging European countries to look to their social systems as assets of future competitiveness rather than burdens of the past.[83] By embracing the positive correlation between low employment protection, generous unemployment benefits and active labour

market policy as a guide for policy, European countries are likely to be able to leverage their social protection systems for comparative advantage in the digital era. Social protection is neither always bad nor always good for competitiveness.[84] Rather, a good balance between social protection and flexibility facilitates employment protection and allows social policy to promote economic growth.

On the production side, finding this balance may be critical in creating distinctly European alternatives in the digital era to *Wintelism*, which was highly rooted in the liberal American experience. If *diversified quality production* and *flexible specialization* represented viable alternatives to *Fordist* mass production in the industrial age, there might well be similar corollaries in the age of digital services. There certainly exists more than one way to use innovations in corporate organization such as modularization and the outsourcing of tasks. High levels of social protection, long seen as a burden, may be the key to unlocking new possibilities that remain closed in the American context. However, only the future will tell whether these can be combined into a larger institutional system of interlocking parts that produces unique service offerings.

While reforms will be necessary, the debate about how nations can get to such an outcome is actively engaged. This is not simply a theoretical or academic debate, but one rooted in ongoing policy processes. Ideas substantively similar to ours were first presented to the European Union's Finance Ministers and Central Bank Governors by Belgian economist André Sapir in 2005.[85] Since then, the European Commission has put on a series of events under the European Employment Strategy on the theme of 'flexicurity', the last one of which even the German Federal Minister for Labour and Social Affairs has been actively involved in, delivering a keynote address on 'Security in

Change – Security through Change'.[86] Recent events suggest that for the first time in the history of European integration, a reasonably coherent political design for a 'European Social Model' may be emerging, which – building on social policy promoting employability and activation – is becoming ever more 'Scandinavian' in substance.[87]

While future reforms will certainly involve their fair share of deregulation and liberalization, the potential efficiency-enhancing benefits of pre-exiting institutions such as the systems of social protection should not be abandoned.[88] Political entrepreneurship will be required to identify traditional strengths and push the necessary changes. As we have argued, digital tools are not a panacea, but rather must be applied in ways compatible with a particular social and institutional context in order to be effective. This holds particularly true in services, which are inherently rooted in social processes. Uniquely European strands of digitally enabled services ranging from internet start-ups to lean retailing can be a reality. Like *flexible specialization* and *diversified quality production* before them, they are likely to provide worthy competition to their American counterparts.

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[1] Parts of this paper were included in preliminary form in a contribution by John Zysman & Tobias Schulze-Cleven to a technical report of the Institute for Prospective Technological Studies. See R. Compañó, C. Pascu, A. Bianchi, J. C. Burgelman, S. Barrios, M. Ulbrich & I. Maghiros (eds), *The Future of the Information Society in Europe: Contributions to the Debate* (European Commission, 2006). For background on the paper's broader interpretative framework, see John Zysman, 'Creating Value in a Digital Era: Exploring the Experimental Economy', in John Zysman & Abraham Newman (eds), *How Revolutionary was the Revolution? National Responses, Market Transitions and Global Technology in the Digital Era* (Stanford University Press, 2006), pp. 23-54.

[2] See, for example, Darius Ornston & Olli Rehn, 'An Old Consensus in the "New" Economy? Institutional Adaptation, Technological Innovation and Economic Restructuring in Finland', in Zysman & Newman (eds.), *How Revolutionary was the Revolution*; Tobias Schulze-Cleven. 'Diverging European Trajectories toward Labor Market Flexibility', PhD Dissertation in Political Science, University of California-Berkeley, forthcoming; Dan Breznitz, *Innovation and the State: Political Choice and Strategies for Growth in Israel, Taiwan, and Ireland* (Yale University Press, 2007).

[3] This section is adapted from John Zysman, 'Manufacturing in a Digital Era: Strategic Asset or Vulnerable Commodity?' in *New Directions in Manufacturing: Report of a Workshop* (The National Academies Press, 2004); See also John Zysman, 'Transforming Production in a Digital Era', in William Dutton, Brian Kahin, Ramon O'Callaghan & Andrew Wyckoff (eds), *Transforming Enterprise* (MIT Press, 2004).

[4] See James P. Womack, Daniel T. Jones & Daniel Roos, *The Machine that Changed the World* (Harper Perennial, 1991).

[5] See Benjamin Coriat, *The Revitalization of Mass Production in the Computer Age*, paper presented at the UCLA Lake Arrowhead Conference, Los Angeles, CA, 14-18 March 1990; Ramchandran Jaikumar, *From Filing and Fitting to Flexible Manufacturing: A Study in the Evolution of Process Control*, Working Paper 88-045, Harvard Business School, 2005.

[6] See Laura Tyson & John Zysman, 'The Politics of Productivity: Developmental Strategy and Production Innovation in Japan', in Chalmers Johnson, Laura Tyson & John Zysman (eds), *Politics and Productivity: The Real Story of How Japan Works* (Ballinger, 1989).

[7] The distinctive features of the Japanese lean production system were a logical outcome of the dynamics of Japanese domestic competition during the rapid growth years, and this system was firmly in place by the time of the first oil shock in the early 1970s. For example, Japan's automobile and electronics firms burst onto world markets in the 1970s and consolidated into powerful conglomerates in the 1980s. The innovators were the core auto and electronics firms who, in a hierarchical manner, dominated tiers of suppliers and sub-system assemblers; the production innovation was the orchestration and reorganization of the assembly and component development process. The core Japanese assembly companies of the lean variety have been less vertically integrated than their American counterparts. Rather, they have been at the centre of vertical Keiretsus, loosely speaking, Japanese conglomerates conventionally understood to be

headed by a major bank or consisting of companies with a common supply chain linking wholesalers and retailers, that have tightly linked the supplier companies to their clients. It cannot surprise that lean production became a focus of American policy and corporate attention because it represented a direct challenge to both mass manufacturing and assumptions of American global economic policy.

[8] The argument is simple: The relationships of production and development in the Japanese production system are so delicate that measures to steady and smooth the expansion of demand in sectors such as autos proved very important for the success of the production innovations; see John Tate, *Driving Production Innovation Home: Guardian State Capitalism and the Competitiveness of the Japanese Automotive Industry* (Berkeley Roundtable on the International Economy, 1995). In Japan, public programs generated domestic rivalries that lead to over-investment and excess capacity. This excess capacity was then 'dumped' off of on international markets. Just-in-time delivery, subcontractor cost/quality responsibility and joint component development pushed on to the subcontractor considerable risks of demand fluctuations. It remains questionable if Japan's emerging auto sector could have continuously absorbed the stops and starts of the business cycle that typified Britain in the 1950s and 1960s. Would the trust relationships that are said to characterize Japan have held up? Could the fabric of small firms have survived to support just-in-time delivery and contractor innovation? Techniques to continuously reappraise demand levels and reduce unpredictability throughout the system as well as government and corporate programs to reduce the capacity break-even point in small firms only go so far.

[9] See Wolfgang Streeck, 'On the Institutional Conditions of Diversified Quality Production', in Egon Matzner & Wofgang Streeck (eds), *The Socio-Economics of Production and Employment* (Edwar Elgar, 1991); Paul Hirst & Jonathan Zeitlin. 'Flexible Specialization: Theory and Evidence in the Analysis of Industrial Change', in J. Rogers Hollingsworth & Robert Boyer (eds), *Contemporary Capitalism: The Embeddedness of Institutions* (Cambridge University Press, 1997).

[10] Michael Borrus & John Zysman, 'Globalization with Borders: The Rise of Wintelism as the Future of Industrial Competition', *Industry and Innovation*, Vol. 4, No. 2 (1997).

[11] Borrus & Zysman, 'Globalization with Borders'.

[12] An earlier take on many of these issues can be found in Zysman, 'Creating Value in a Digital Era: Exploring the Experimental Economy'.

[13] Stephen S. Cohen, Bradford Delong & John Zysman, *Tools for Thought: What is New and Important about the "E-conomy"?* (Berkeley Roundtable on the International Economy, 2000), pp. 7-8.

[14] See Claude Elmwood Shannon, 'A Mathematical Theory of Communication', in N.J.A. Sloane & Aaron D. Wyner (eds), *Claude Elmwood Shannon: Collected Papers* (IEEE Press, 1993).

[15] Often disruptive technologies, which are capable of supporting newcomer entry into the market, are difficult to develop by established companies in-house. See Clayton Christensen, *The Innovator's Dilemma: When New Technology Causes Great Firms to Fail* (Harvard Business School Press, 1997).

[16] Many of the engineering schools are rooted in science-based engineering, solving engineering problems by working with fundamental principles. The Bayh-Dole Act pushed universities into 'marketable' technologies developed with federal funding. An array of mechanisms, from licensing through facilitating 'spin-offs' to institutions for joint development, have been established at the major technology universities to facilitate ties to industry. In addition, companies turn to the start-ups or spin-out the development of particular elements of products or services, because they feel that many projects are best developed outside the traditional hierarchy of a major company. Firms from Intel through Nokia to IBM establish such mechanisms as their own investment companies and support startups as an approach to technology development and an alternative to internal development. Companies also set up joint product development projects with other companies to combine technology strengths. Finally, they establish technology development outposts, both to monitor developments and to tap into distinctive pools of talent and technology around the world.

[17] Richard Baldwin, 'Globalization: The Great Unbundling(s)', Paper contributed to the project 'Globalization Challenges for Europe and Finland', organized by the Secretariat of the Economic Council, 2006.

[18] Steven Weber, *The Success of Open Source* (Harvard University Press, 2004).

[19] Generally, there are at least three circumstances when in-house control of a particular activity, can be a strategic advantage: first, if the in-house control of the activity provides advantage in cost, timing of goods to market, quality, or of distribution that cannot be obtained by outsourced production; second, if knowledge about existing processes is required to develop a 'next generation' of this activity, or put differently, in-house production mastery may be required for rapid product innovation; third, if critical

intellectual property about the activity itself is so tightly woven into the value of a firm's product that commodity outsourcing is tantamount to transferring knowledge to competitors.

[20] See Dan Bresnitz, *Innovation and the State: Political Choice and Strategies for Growth in Israel, Taiwan, and Ireland* (Yale University Press, 2007).

[21] Thanks to Emilie Lasseron for this observation. She is currently developing these ideas further in her work on user-centred design in a digital age.

[22] The result, of course, is a policy struggle about what information can be gathered, shared and combined. The wishes of companies and governments to assemble information from diverse sources into consumer profiles or threat assessments is set against individual rights for privacy and community needs for the integrity of the individual.

[23] Gary Fields, *Territories of Profit: Communications, Capitalist Development, and the Innovative Enterprises of G. F. Swift and Dell-Computer* (Stanford University Press, 2003); Martin Kenney & David Mayer, *Economic Action Does Not Take Place in a Vacuum: Understanding Cisco's Acquisition and Development Strategy*, BRIE Working Paper 148, Berkeley Roundtable on the International Economy, 2002.

[24] Barbara Baran, *The Technological Transformation of White Collar Work: A Case Study of the Insurance Industry*, PhD Dissertation, University of California, Berkeley, 1986.

[25] Carl Shapiro & Hal R. Varian, *Information Rules*, (Harvard Business School Press, 1998).

[26] John Zysman, 'Creating Value in A Digital Era', VTT Going Global Conference, Helsinki, 21-22 September 2006.

[27] Alternatively, consider pharmaceuticals. If NextGenPharma sells a drug to be dispensed by a doctor or hospital, or sold in a pharmacy, it is producing a product. With gene mapping and molecular analysis, we are moving toward the possibility of a service model of therapies adapted to particular physiologies. If NextGenPharma really is a database company with a store of detailed molecular-level drug information and genome functionality, it could sell an online service to customize drugs or therapy.

[28] The examples of Kone and the mining company come from collaborating partners on this project.

[29] See Cohen, Delong, & Zysman, *Tools for Thought*.

[30] Niels Christian Nielsen & Maj Cecilie Nielsen, 'Spoken-about Knowledge: Why it takes much more than 'Knowledge Management' to Manage Knowledge', in Zysman & Newman (eds), *How Revolutionary was the Revolution*.

[31] Edward Lorenz & Antoine Valeyre, 'Organisational Change in Europe: National Models or the Diffusion of a New "One Best Way"?', paper presented at DRUID Summer Conference, Elsinore, Denmark, 14-16 June 2004.

[32] Certainly the dotcom era bubble reflected greedy projections of assumption rarely reassessed of greed and hope. In fear that the 'moment' would pass by, images that were projections of possibilities were taken as solid facts.

[33] See Stephen S. Cohen, Laura Tyson, John Zysman & David Teece, 'Competitiveness' (Volume III of the Report of the President's Commission on Industrial Competitiveness). BRIE Working Paper 8, Berkeley Roundtable on the International Economy, 1984; this argument is also being developed in work on regional growth by Stowsky, Nielsen & Zysman. A current take can be found in Zysman & Newman (eds), *How Revolutionary was the Revolution*.

[34] However, isolated state action is not the solution; indeed, it never was. It is an important part of a regional development strategy that needs to span both the public and private sectors. The history of most crucial developments in the digital era – the development of the internet being among them – is one of the interplay of both public purposeful action and user-driven innovation enabled by deregulation. Private actors will (have to) continue to be the source of much of the needed entrepreneurialism.

[35] This infrastructure includes both physical resources such as broadband lines, road and bridges, and the political and social institutions of the marketplace. The latter is particularly important; it encompasses the rules that permit companies to innovatively deploy resources and be rewarded for successful implementation in the face of risk and imagination. Good protections of intellectual property are basic provisions in this context.

[36] Framing the debate about increasing labour market flexibility as one of maintaining-versus-retrenching the welfare state is unfortunate, because it masks the real issues. Neither from a theoretical vantage, nor from an empirical perspective, do deregulation and reductions in social benefits seem to increase labour market performance. The debate, as it often structured, fails to recognize the positive incentives provided

by many welfare state programs. See Richard B. Freeman, 'Labor Market Institutions without Blinders: The Debate over Flexibility and Labour Market Performance', *International Economic Journal*, Vol. 19, No. 2 (2005), pp. 129-45; Tobias Schulze-Cleven, 'The Politics of Increasing Labour Market Flexibility in Europe: The UK, Germany and Denmark', paper presented at the Annual Meeting of the American Political Science Association, 1-4 September 2005, Washington, DC.

[37] See Cohen, Tyson, Zysman & Teece, 'Competitiveness'.

[38] See Mark Granovetter, 'Economic Action and Social Structure: The Problem of Embeddedness', *American Journal of Sociology*, Vol. 91, No. 3 (1985), pp 481-510, and John Zysman, 'How Institutions Create Historically Rooted Trajectories of Growth', Industrial and Corporate Change, Vol. 3, No.1 (1994), pp. 243-83.

[39] The phrase 'flexible rigidities' is taken from Ronald Dore, *Flexible Rigidities: Industrial Policy and Structural Adjustment in the Japanese Economy, 1970-80* (Athlone Press, 1986).

[40] First, for standard commodities, prices and quantity are positively correlated. This is not the case for the labour supply function, which tends to display the opposite relationship at both ends of the supply spectrum; higher wage offerings can induce workers to choose more leisure, while the lowering of wages can prompt workers to extend their hours to reach a given income necessary for a particular living-standard. Second, with workers' skill levels diverging greatly, national labour markets will always be segmented into much smaller markets for labour with similar skill profiles. Third, to employ workers productively, employers are dependent on the repeated and active collaboration of their workers for both the build-up of firm-specific skills and the simple fulfillment of tasks. See Wolfgang Streeck, 'The Sociology of Labor Markets and Trade Unions', in Neil J. Smelser & Richard Swedberg (eds), *The Handbook of Economic Sociology* (Princeton University Press, 2005).

[41] For innovative work in labour economics, see George Akerloff, An Economic Theorist's Book of Tales: Essays That Entertain the Consequences of New Assumptions in Economic Theory (Cambridge University Press, 2006). Robert Solow goes even further by openly speaking of the labour market as a 'social institution', See Robert M. Solow, *The Labor Market as a Social Institution* (Basil Blackwell, 1990).

[42] For a widely-cited recent statement of this argument, see Margarita Estevez-Abe, Torben Iversen & David Soskice, 'Social Protection and the Formation of Skills: A Reinterpretation of the Welfare State', in

Peter Hall & David Soskice (eds), *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage* (Oxford University Press, 2001). The problems of British policy-makers to encourage workers' investments in specific skills are legendary.

[43] See Karl Polanyi, *The Great Transformation. The Political and Economic Origins of Our Time* (Beacon Press, 1944). For Polanyi, the creation of labour markets was a deeply political transformative processes that challenged the long-standing governance of social life by such non-market values as reciprocity and redistribution. For him, labour remained a 'fictitious commodiy' due to it having never been produced for the purpose of exchange.

[44] Using the peculiar shape of the labour supply function and both the specificity and short-term inelasticity of workers' human capital for their advantage, employers could determine the terms of the employment relationship and wait until workers had accepted their demands. For more elaboration, see Streeck, 'The Sociology of Labor Markets and Trade Unions'.

[45] See Wolfgang Streeck, 'Beneficial Constraints: On the Economic Limits of Rational Voluntarism', in Hollingsworth & Boyer (eds), *Contemporary Capitalism: The Embeddedness of Institutions*; Wolfgang Streeck, 'German Capitalism: Does It Exist? Can It Survive?', New Political Economy, Vol. 2, No. 2, pp. 237-56.

[46] See John L. Campbell, 'Institutional Competitiveness – A Broad Perspective on Competitiveness', paper prepared for presentation at the Danish Globalization Council's meeting on 'Challenges for Cohesion in a Globalised World', Copenhagen, 23-24 February 2006, http://www.globalisering.dk (accessed 08 July 2006).

[47] See The Economist Intelligence, 'Economist Intelligence Unit ranks Denmark as best place to do business', Press release, 30 March 2005; World Economic Forum, *Global Competitiveness Report* (World Economic Forum, 2005-2006).

[48] Estevez-Abe, Iversen & Soskice, 'Social Protection and the Formation of Skills: A Reinterpretation of the Welfare State'.

[49] See Thomas Bredgaard, Flemming Larsen & Per Kongshøj Madsen, 'Opportunities and Challenges for Flexicurity – the Danish Example', Transfer, Vo. 12, No. 1 (2006), pp. 61-82; For an overview of different countries' attempts to increase their employment rates, see Jonah D. Levy, 'Activation through Thick and

Thin: Progressive Strategies for Increasing Labor Force Participation', in Martin Levin and Martin Shapiro (eds), *Transatlantic Policy-Making: Policy Drift, Paths Taken and not Taken in the Age of Austerity* (Georgetown University Press, 2004).

[50] OECD, *Employment Outlook*, (OECD, 2005), p. 258.

[51] Eurobarometer, *The Future of Europe* (The European Commission, May 2006).

[52] See e.g. Peer Hull Kristensen, 'Business Systems in Age of the "New Economy": Denmark Facing the Challenge', all in Campbell, Hall & Pedersen (eds), *National Identity and the Varieties of Capitalism: The Danish Experience* (McGill-Queen's University Press, 2006); alternatively, see Campbell, 'Institutional Competitiveness – A Broad Perspective on Competitiveness'.

[53] Peter Auer, *Protected Mobility for Employment and Decent Work: Labour Market Security in a Globalised World*, Employment Strategy Papers (2005/01), ILO Employment Analysis and Research Unit, Geneva.

[54] Often, the requirement to participate in training is enough to 'motivate' some unemployed to take up a new job.

[55] In 2003, participation rates in training and lifelong learning activities during the past 12 months in Denmark was about twice the average of the EU 25 in 2003, 80 versus 42 per cent for the population aged 25-64, and 41 versus 14 percent among the unemployed. See Eurostat, 'Lifelong learning in Europe', Statistics in Focus, Populations and Social Conditions (08/2005). The OECD uses more narrow measures and reports participation rates in non-formal, job-related continuing education and training activities of 35 per cent for the unemployed and 47 per cent for the employed, both of which represent the highest shares within the OECD. See Bredgaard, Larsen & Madsen, 'Opportunities and Challenges for Flexicurity – the Danish Example'.

[56] For a discussion of the skills needed in the future, see Frank Levy and Richard J. Murnane, The New Division of Labor – How Computers are Creating the Next Job Market (Princeton University Press, 2004).

[57] Bredgaard, Larsen & Madsen, 'Opportunities and Challenges for Flexicurity – the Danish Example'.

[58] We admit that the current Liberal government is trying to get employers and unions to assume a higher share in financing the training schemes.

[59] Frank Dobbin & Terry Boychuk, 'National Employment Systems and Job Autonomy: Why Job Autonomy is High in the Nordic Counties and Low in the United States, Canada and Australia', *Organization Studies*, Vol. 20, No. 2 (1999), pp. 257-92.

[60] In their attempt to make sense of their economy's performance, Danish commentators take the theme of 'learning' even further. They characterize Danish arrangements as promoting a 'learning society' to succeed in an emerging 'learning economy'. We like this framing, as it directly supports our argument. See e.g. Peter Nielsen and Bengt-Åke Lundvall, 'Innovation and Job Creation in the Learning Economy', in Thomas Bredgaard & Flemming Larsen (eds) Employment Policy from Different Angles (DJØF Publishing, 2005), pp. 505-22; Henning Jørgensen, 'Denmark – A Learning Society?' (ETUI, 2004).

[61] The analysis was conducted using data from the third European Survey on Working Conditions; see Pascal Paoli & Damien Merllié, *Third European Survey on Working Conditions 2000* (Office for Official Publications of the European Communities, 2001). As mentioned at an earlier point in the article, the authors distinguish between the 'lean' production model, and the newly conceptualized 'learning' model as corporate organizational templates geared towards the competitive marketplace of the digital era. Both models display stronger learning dynamics and higher problem-solving activity on the part of employees than either taylorist or pre-Fordist traditional organizations. However, the learning model constitutes a distinct way of delivering flexibility and cooperation within the company. Companies organized along the lines of the lean model display such attributes as the strong use of teamwork, job rotation, quality management and multiple work pace constraints. In contrast, the uniquely socially embedded learning model is more decentralized and grants employees a high degree of autonomy.

[62] For example, Sabel reports that shop stewards in the metalworking industry invented new payment, training, and job classification systems to increase the flexibility of production and the general skill level among workers; see Charles Sabel, 'Flexible Specialization and the Re-Emergence of Regional Economies', in Ash Amin (ed), *Post-Fordism: A Reader* (Blackwell, 1994), pp. 136.

[63] John L. Campbell & Ove K. Pedersen, 'The Varieties of Capitalism and Hybrid Success', *Comparative Political Studies*, Vol. 40, No. 3, pp. 307-32; Peer Hull Kristensen and Jonathan Zeitlin, *Local Players in Global Games: The Strategic Constitution of a Multinational Corporation* (Oxford University Press, 2004).

[64] See http://www.greatplacetowork-europe.com/best/list-eu.htm for a complete listing of the top 100 firms as well as the methodology for their calculation.

[65] See Nicholas Véron, 'So Few Great Places to Work,' *La Tribune*, 21 May 2007.

[66] The economic success of Denmark in the current market environment has come as a surprise to many analysts. As recently as in 1990, influential business analyst Michael Porter predicted Denmark's certain decline on account of its outdated political economy. Now, with employment and growth numbers envied by many other European countries, politicians and academics have started to speak of the Danish 'miracle', see Herman Schwartz, 'The Danish "Miracle": Luck, Pluck or Stuck?', *Comparative Political Studies*, Vol. 34, No. 2 (2001), pp. 131-55. Such talk is partially due to the relative inability of established frameworks to account for the Danish success story. Denmark could not build on a legacy of high-technology industries or homegrown multi-national corporations such as neighbouring Sweden. Rather, Denmark's performance largely rests on small and medium-sized enterprises in sectors that were originally seen as being mature, generating slow growth and exhibiting low technological intensity. With the analytic framework developed in this essay, we can get a handle on understanding why the country was able to weather the storms of the digital era.

[67] See Fremtidens Vækst Taenketanken, 'Vision 2020' (http://www.fremtidensvaekst.dk/, accessed 10 May, 2007) and a series of reports by the McKinsey Global Institute, 'Offshoring: Is it a Win-Win Game?' (August 2003), 'Can Germany Win from Offshoring?' (July 2004) and 'How Offshoring of Services Could Benefit France' (June 2005). Denmark and the United States are estimated to receive accumulated gains of $1.14 – $1.17 for every $1.00 spent on services offshoring, while Germany with its less flexible labour market is seen to gain only $0.74 for every $1.00 spent.

[68] Peter Auer, *Protected Mobility for Employment and Decent Work*. Admittedly, however, the growth models of the Scandinavian countries share important similarities, see Robert Boyer, 'New Growth Regimes, But Still Institutional Diversity', *Socio-Economic Review*, Vol. 2, No. 1 (2004), pp.1-32.

[69] For the one of the best reviews on different classification schemes, see Wil Arts and John Gelissen, 'Three worlds of welfare capitalism or more? A state-of-the-art report', *Journal of European Social Policy*, Vol. 12, No. 2 (2002), pp. 137-58. The classic treatment is Gøsta Esping-Anderson, *The Three Worlds of Welfare Capitalism* (Princeton University Press, 1990).

[70] For a clear distinction between two fundamental ways of protecting workers' against uninsurable labour market risk, i.e. either preventing worker lay-offs through employment protection legislation (EPL) or providing unemployment benefits (UB), see Tito Boeri, *Let Social Policy Models Compete and Europe Will Win*, paper presented at a conference hosted by the Kennedy School of Government, Harvard University, 11-12 April 2002.

[71] More recently, at least in Germany, 'outsiders' have been more able to gain employment, albeit often only in 'second-class' jobs with fewer protections and worse pay than 'regular' jobs.

[72] See, for example, Torben Iversen, *Capitalism, Democracy and Welfare* (Cambridge University Press, 2005). Iversen creates exciting new ways to link choices about skills to a larger dynamic of welfare and party politics intended to account for national variation in skills and social protections of skills. See also John Zysman with Bartholomew C. Watson, 'Capitalism, Democracy and Welfare *and* Inequality and Prosperity: Social Europe vs. Liberal America', *Perspectives on Politics*, Vol. 5, No. 1 (2007), pp. 215-17 for a critique on the limitations of Iversen's argument in the digital era of productivity-enhancing services.

[73] A population's readiness to accept high levels of taxation might be one of the prerequisite's of the Danish variant of the flexicurity model. This, however, cannot be created over night. See Yann Algan and Pierre Cahuc, Civic Attitudes and the Design of Labor Market Institutions: Which Countries Can Implement The Danish Flexicurity Model?, IZA Discussion Paper No. 1928 (2006), Institute for the Study of Labor, Bonn. Small countries might have distinct advantages, see Wolfgang Streeck, *Competitive Solidarity: Rethinking the 'European Social Model*, MPIfG Working Paper 99/8, Max Planck Institute for the Study of Societies, Cologne. See also Peter Katzenstein, 'Denmark and Small States' in Campbell, Hall & Pedersen (eds), *National Identity and the Varieties of Capitalism: The Danish Experience*.

[74] Jonah Levy, Mari Miura & Gene Park, 'Exiting Etatisme? New Directions in State Policy in France and Japan' in J. Levy (ed), *The State after Statism: New State Activities among the Affluent Democracies* (Harvard University Press, 2006).

[75] Pierre Cahuc & Francis Kramarz, *De la Précarité à la Mobilité: Vers une Sécurité Sociale Professionnelle* (Ministre d'Etat, Ministre de l'Economie, des Finances et de l'Industrie et au Ministre de l'Emploi, du Travail et de la Cohésion Sociale, 2004).

[76] On Spain, see Sara Watson, *Party Strategies and the Politics of Social Protection in Post-Authoritarian Southern Europe*, PhD Dissertation in Political Science, University of California, Berkeley, 2006.

[77] Among other things, reforms in the mid-1990s included selective decentralization, the sharpening of incentives and introducing more competitive elements into a highly cooperative system. Two reforms stand out in particular, reducing the eligibility periods for unconditional unemployment insurance benefits and expanding the training offerings for the unemployed.

[78] Ton Wilthagen, 'Striking a Balance? Flexibility and Security in European Labour Markets', in Bredgaard & Larsen (eds), *Employment policy from different angles*, p. 265.

[79] OECD, *Employment Outlook* (OECD, 1997).

[80] The Danish Confederation of Trade Unions stresses that 'Danish companies are more willing to hire new employees in times of economic revival than their European competitors, who have trouble letting off workers when the economy goes downhill again', see Thomas Fuller, 'The Workplace: Firing's Easy in Denmark; so is Hiring', *International Herald Tribune*, 15 December 2004. Moreover, in the mid-1990s, they agreed to reduce the reduced unemployment benefit eligibility periods if training offerings were increased.

[81] Fritz W. Scharpf, 'Employment and the Welfare State: A Continental Dilemma', in Bernhard Ebbinghaus & Philip Manow (eds), *Comparing Welfare Capitalism: Social Policy and Political Economy in Europe, Japan and the USA* (Routledge, 2001); Gøsta Esping-Anderson, 'The Welfare States without Work: The Impasse of Labour Shedding and Familialism in Continental European Social Policy', in G. Esping-Anderson (ed), *Welfare States in Transition: National Adaptations in Global Economies* (Sage, 1996); Philip Manow & Eric Seils, 'Adjusting Badly: The German Welfare State, Structural Change, and the Open Economy', in Fritz W. Scharpf & Vivien A. Schmidt (eds), *Welfare and Work in the Open Economy (vol. II): Diverse Responses to Common Challenges* (Oxford University Press, 2001).

[82] For a similar argument, see also Iversen, *Capitalism, Democracy and Welfare*.

[83] Jørgen Goul Andersen, 'The Danish Welfare State as 'Politics for Markets': Combining Equality and Competitiveness in a Global Economy', *New Political Economy*, Vol. 12, No. 1 (2007), pp. 71-8.

[84] For a review on social welfare and competitiveness, see Ian Gough, 'Social Welfare and Competitiveness', *New Political Economy*, Vol. 1, No. 2 (1996), pp. 209-32.

[85] In his presentation, Sapir made use of some of the findings of welfare state research and economic statistics used also in our article. See André Sapir, 'Globalisation and the Reform of European Social Models', paper prepared for presentation to the European Union's Finance Ministers and Central Bank Governors at the ECOFIN informal meeting under the British Presidency of the EU, Manchester, 9 September 2005. A modified version has been published as a Policy Brief by Bruegel, a Brussels-based Think Tank in October 2005. For justified criticism on Sapir's paper, see Andrew Watt, Maria Jepsen and Henning Jørgensen, 'Critical Comments on André Sapir's "Globalisation and the Reform of European Social Models"', ETUI-R, 2005.

[86] Franz Müntefering, 'Sicherheit im Wandel – Sicherheit durch Wandel', speech delivered at the Stakeholder Conference on Flexicurity, Brussels, 20 April 2007.

[87] See call for papers, ESPAnet Doctoral Researchers Workshop 'The European Social Model and Beyond', 06-08 December, 2007 (Convenors: Prof. Ilona Ostner, Georg-August-Universität Göttingen; Prof. Stephan Lessenich, Friedrich-Schiller-Universität Jena).

[88] See Ornston & Rehn, 'An Old Consensus in the "New" Economy? Institutional Adaptation, Technological Innovation and Economic Restructuring in Finland'.