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A Tribute to Frank Wilkinson¹

Abstract

This tribute article acknowledges the lifetime contributions of Frank Wilkinson to social sciences in general and the *Cambridge Journal of Economics* in particular. He was not only a founding editor of the *Cambridge Journal of Economics* but in his later years he was also elected a Patron of the Journal in recognition of his contributions.

Introduction

Frank Wilkinson, who has died aged 86, was an emeritus Reader in Applied Economics and emeritus Fellow of Girton College at the University of Cambridge. His path to economics research and teaching at Cambridge was far from conventional. Frank was a Derbyshire miner’s son, one of 11 children who, despite passing his 11 Plus exam and entering grammar school, left at age 15 to take up manual work, first as a farm worker, then as a chef in the army (conscripted, not as a volunteer) and finally as a steel worker. Here, he took up the option of studying on an extra mural release course dedicated to miners at Nottingham University where he was tutored by the left-wing scholar and activist Ken Coates, himself an ex-miner. From there he moved, via a series of scholarships, first to Ruskin College, Oxford² and then to Kings College Cambridge. He initially opted to study archaeology and anthropology but soon returned to the study of economics.

After graduating, he started postgraduate work as a British Steel Research Fellow but soon moved into the Department of Applied Economics (DAE) at Cambridge, where he stayed for more than 30 years. He worked first with Bert Turner and his industrial relations group (Wilkinson and Turner, 1972), before joining Wynne Godley’s Cambridge Economic Policy Group (CEPG)³ and later establishing the Cambridge Labour Studies Group. From 1990 he became a key figure in the Centre for Business Research; this was first based in the DAE but relocated, after Frank’s 2001 retirement, to the Judge Business School. In 1977 Frank was one of the first two men to be elected fellows of Girton College. When he retired the college established a ‘Frank Wilkinson Official Fellowship in economics’.

While Frank always remained rooted in Cambridge, he held two posts elsewhere that proved of great importance to him. For several years from the mid-1980s onwards, he was a visiting professor at the University of Notre Dame in Indiana, where he forged many strong connections, above all with Chuck Craypo and Sue Konzelmann. Sue, in particular, became one of his main collaborators in what was a very active retirement. In the 1990s, Frank also

¹ We are grateful to the editors of the *Cambridge Journal of Economics* for the opportunity to write this tribute article. We would also like to thank Jane Humphries, Michael Best and Roger Tarling for helpful comments on the draft paper.

² Ruskin College was at that time an independent educational college with links to trade unions that provided opportunities for those with no or low qualifications.

³ Frank’s contributions to the Cambridge Economic Policy Group between 1975 and 1982 can be found here: <https://cpes.org.uk/om/cepr>.

held an honorary position at Birkbeck College, University of London, where he helped establish a course for trade unionists, enabling him to come full circle by providing the kind of educational opportunities to the working class from which he himself had so benefitted.

Despite the hallmarks of a classic case of upward social mobility supported by the generous provision of scholarships and grants during the 1950s and 60s, Frank kept at least one of his feet firmly planted in his origins as a Derbyshire miner's son and member of the manual working class. His origins and early experience not only gave him his motivation to use his research to support progressive social and economic policies but also provided strong insights into the underlying dilemmas and contradictions of capitalism. Perhaps somewhat more surprising was the planting of his other foot almost equally firmly in the field of heterodox economics traditions as imbibed through his education at Cambridge. This Cambridge tradition offered the opportunity and the tools to develop a more integrated analysis that combined the economic with the political and the social. The emerging threat to that tradition led him to become one of the four founders of the *Cambridge Journal of Economics* in 1977. His immense contribution to the journal and total commitment to its mission to publish heterodox economics was recognised by his election as a Patron of the journal during his last years. This commitment to the journal stemmed from both the deep impact that the Cambridge tradition had on his own work and from his recognition that the re-emergence and overwhelming dominance of the neoclassical paradigm was impoverishing both the discipline of economics and the scope for progressive politics.

Frank was not simply a follower of the Cambridge tradition but an innovator in his own right. He built on the rejection of both the marginal productivity theory of distribution (by Joan Robinson and associates) and the pre-Keynesian assumptions of an automatic tendency towards full employment through market clearing, to move beyond the narrow boundaries of conventional economics and develop a more integrated analysis of the mutual interactions between economic, social and political forces. A hallmark of his work was attention to historical context. He used this broader and historically-embedded framework to further the Cambridge tradition by returning to some of the core Cambridge economics questions, such as the role of real versus money wages in shaping processes of wage setting and inflation. Here, he also drew upon the work of Michal Kalecki who had brought class conflict and divergent interests into the Cambridge Keynesian inspired debates on macroeconomics. And pervading his work was the legacy of Brian Reddaway's attention to the use of empirical data to illuminate economic problems; Frank subscribed to the maxim oft cited by Reddaway that it is "better to be roughly right than precise and wrong (or irrelevant)" (Singh, 2009).

To explore Frank's work, his contributions have been categorised by topic, into (1) inflation and distribution, (2) labour market segmentation, (3) productive systems and (4) wage determination, productivity, and labour market regulation. In each section, the core methodological approaches that drove his contributions are drawn out, underlining the coherence of his world view. The first is his insistent rejection of the concept of equilibrium and his belief in notions of non-equilibrium and virtuous and vicious circles (in line with Kaldorian growth theory). The dynamics of the economy – or to use Frank's term "productive systems" – were driven by power relations on the one hand, and the mutual dependency between capital and labour on the other, such that "the evolution of a productive system is, therefore, a dialectical process in which economic and institutional elements dynamically interact" (Wilkinson 2003, p. 13). For Frank, the Cambridge tradition was more concerned with the macroeconomy and had little to say about the organisation of the industrial system. In seeking to fill this lacuna, he developed his notion of "productive

systems”, through which he identified tendencies towards cumulative comparative advantage and disadvantage within national economies, in tune with the now widely recognised varieties of capitalism literature (Hall and Soskice, 2001). His approach avoided the functionalist tendencies found within the core varieties of capitalism models where class and distributional conflict play only a limited role.

Although influenced by Marxist theory, Frank tended to reject all overarching ideological theories. Instead, he called for both a greater historical sensitivity and a more nuanced understanding than, for example, simply focusing on capitalist efforts to control labour or the role of conflict in driving change. It was important to go beyond capital and labour relations to include inter-capitalist competition, that involved not only cost-based competition but also competition through innovation that needed the support of an engaged workforce. Likewise, intra-working class divisions could influence the path of industrial development and capital-labour relations. For Frank, traditional Marxist analysis “seriously underestimated the wealth-creating potential of capitalism which has enabled both the maintenance of profits and real wage growth” (Wilkinson 2003, p. 416). However, this potential for positive outcomes was undermined, as Kalecki had noted, by the failure of institutional and political innovation to accommodate the rising aspirations of the working class. The failure to incorporate workers’ interests into the institutions of the capitalist system also, in Frank’s view, called for a sceptical approach to the actions of the state. For Frank, what mattered was the development of institutions that constrained the actions of employers and prevented the transfer of responsibility for support of workers’ living standards to the state; hence his lifetime support for a minimum wage and his equally strong distrust of in-work benefits.

Good labour market standards would have the added advantage of ensuring that best use was made of government expenditure by removing the risk that any attempt to help the working poor would merely provide wage subsidies for the inefficient employers and lead to declining pay levels, increasing employment insecurity, growing poverty and burgeoning social welfare expenditure (Tarling and Wilkinson, 2003, pp. 231-2).

Inflation: A Distributional Issue

Frank’s work on inflation brought together all his main passions and influences. By examining how consumption norms were shaped by workplace, community and family organisation and how challenges to these living standards were resisted by worker organisation and trade unions (Wilkinson and Turner, 1972; Tarling and Wilkinson, 1977; Wilkinson, 2000, Wilkinson, 2012), he was able to combine his insights into the history of the working class with his concern to fill a huge gap in the Cambridge school of economics. With the exception of the work of Kalecki, Cambridge economists had largely failed to address or recognise the active role of the working class in shaping macroeconomic and microeconomic outcomes. For Frank, one of the key blockages to the pursuit of Keynesian-type full employment policies, was, as Kalecki had also understood, a failure of the institutions of capitalism to adjust to and accommodate the rising expectations and demands for a better standard of living from the working class. The consequence was a chronic tendency towards deflation as governments sought to control demands for better living standards through weakening the bargaining power of the working class.

Kalecki was right to be sceptical; the modern economies have failed to develop the political and social institutions, at either domestic or international level, that are

needed to make permanent full employment compatible with capitalism (Robinson and Wilkinson, 1977, p. 13)

The conflicts and contradictions in wage setting – in both the monetary form and in the real wage outcomes - was not only a continuous theme for his research and contributions over his working life but also provided a key link between macroeconomics and meso and micro level forms of economic and social organisation (for example firms, sectors, trade unions, families and communities). These subjects were often dismissed as outside the scope, and indeed the vision of macroeconomists and grand theorists. For Frank, the failure of conventional economics from neoclassical to Keynesian to provide an adequate analysis of how these forms of economic and social organisation function (particularly firms and families), left a gaping hole between macroeconomics on the one hand, and the maintenance of an individualised approach to microeconomics on the other. This disconnect restricted the theoretical contribution of the Cambridge school.

In relation to the macroeconomic analysis of inflation, Frank made a significant contribution in his early renowned work with Bert Turner on “Do Trade Unions Cause Inflation?” (Wilkinson and Turner, 1972); this approach was further developed in his subsequent work for the CEPG with Roger Tarling. This work pointed to a number of fallacies in the popular policy approach to controlling inflation at that time, namely incomes policies. Frank took issue with the Keynesian belief that workers only bargained in relation to monetary and relative wages. By introducing the notion of an historically-determined customary standard of living that was embedded in consumption patterns and the structure of the economy (Wilkinson, 2012), workers could be seen as reacting to changes in their standard of living as a consequence of the erosion of real wages. This reaction to past price increases stood in contrast to the dominant cost-push models of inflation which assumed the dynamics lay in bargaining over relative wages or over anticipated changes to prices. Frank showed that cost-push pressures were often externally driven by changes in government tax policies (Wilkinson and Turner, 1972) or changing world commodity prices or exchange rates (Wilkinson, 2000).

As stabilising world commodity prices and exchange rates was not something that could be addressed by individual nation states, governments had a tendency to seek to achieve lower inflation by weakening the power of labour through deflationary fiscal and monetary policies, a policy approach that exacerbated problems of declining real wages. In the 1970s the favoured approach to solve the inflation problem was to combine deflationary macroeconomic policy with incomes policies. Tarling and Wilkinson (1977) argued that this combination was particularly unlikely to work in the UK context. In part this was because incomes policies bore down primarily on public sector wage settlements, leading to major increases in trade union membership and resistance in these sectors. In addition, the fragmented and uncoordinated nature of the collective bargaining system in the UK enabled trade unions to reduce the time between wage settlements once real wages came under pressure, further accelerating inflation. This contrasted with the coordinated bargaining system found, for example, in the Nordic countries. These systems not only enabled wage growth to be kept in line with high productivity sectors but also ensured that the gains from productivity were not limited to those working in high productivity firms but were shared more widely. This alternative interpretation of the relationship between wage bargaining and inflation fed in to the CEPG’s macroeconomic analysis, supported by a new wage settlement index constructed by Tarling and Wilkinson to measure the wage settlements actually taking place, rather than the standard average earnings index.

While much of Frank's work, within the CEPG and elsewhere, was directed at critiquing current policy agendas towards the control of inflation, he constantly brought the discussion back to the implications of his analysis for some of the theoretical controversies associated with the Cambridge school of economics. These included the internal contradictions in Keynes' framework: aggregate employment was expected to respond positively to increases in real wages due to the impact on aggregate demand but was also expected to depend on declining real wages due to Keynes' retention of the notion of diminishing marginal returns to employment. Frank quoted Keynes's own acceptance that empirical studies had "seriously shaken" the assumptions behind marginal productivity theory but no satisfactory alternative perspective was provided (Wilkinson, 2000, p. 646). For Frank, this stemmed from Keynes' belief that workers neither reacted to nor were able to influence the level of real wages.

Frank sought to fill this gap by putting substance behind the aspiration for real wages through the development of a dynamic analysis of the customary standard of life. His historical analysis of the development of consumption norms (Wilkinson, 2012), influenced by the work of Jane Humphries (Humphries, 1977) and Antonella Picchio (1981), was also used to extend Piero Sraffa's (Sraffa, 1960) notion of subsistence as the determinant of wage costs. Sraffa's theory did not address the distribution of the surplus between capital and labour and consequently failed to provide a dynamic analysis of what constitutes subsistence. Frank (Wilkinson, 2012) traced the various mechanisms through which workers gain access to a share of the surplus, including, for example, the expansion of credit and the spread of consumption norms across different class groups. This resulted in an evolving customary standard of life that underpinned resistance to real wage reductions ("subsistence" in Sraffa's terminology) at any point in time

Frank's analysis of inflation also highlighted the failure of the Cambridge school – with the exception of Kalecki – to address distributional struggles as a core driver of behaviour and hence of economic outcomes such as inflation. In part this was because of the tradition that orthodox economists did not like to discuss politics (Robinson and Wilkinson, 1977, p. 8), thereby not only separating the economy from the society in which economic activity was located but also leading to unresolvable theoretical puzzles. In contrast, Frank put distributional struggles at the centre of inflation analysis, endorsing Bob Rowthorn's (1977) more Marxist-inspired conflict theory of inflation where resource gaps in the economy's ability to meet aspirations for real wages, on the one hand, and profits, on the other, could lead to price spirals - often resolved by governments through deflationary measures aimed at reducing workers' bargaining power. However, in his reworking of Rowthorn's model, Frank rejected a simplistic unified capital versus labour contest over resources. Instead, he brought in the notion of primary and secondary labour groups, with exploitation of the latter weaker groups (whether domestic or international workers) providing one means of resolving the gap in aspirations between core workers and capital. At the same time, he resisted simplistic insider-outsider analyses of union strategies, recognising that trade unions are aware that the composition of the core protected groups may change over time and that failing to extend the protections of the core to wider groups may put the core at risk. Thus, it is not only class conflict but dynamic processes of segmentation – as discussed in the next section – that inform his model of conflict-related inflation.

Developing a Dynamic Theory of Labour Market Segmentation

Labour market segmentation was a core focus of Frank's work, as symbolised in the founding of the International Working Party on Labour Market Segmentation (IWPLMS) in 1979.

However, Frank was an exponent of what has come to be known as the European version of labour market segmentation theory and not the American contributions which were dominating debate at the time. In fact, the foundation of the IWPLMS came about because of an idea by a Cambridge colleague, John Eatwell, to confront American and Cambridge visions of segmentation by seeking US funding to bring the key American authors such as Peter Doeringer and Michael Piore and Richard Edwards, Michael Reich and David Gordon to Cambridge. The initial bid failed but alternative funding was made available by the Nuffield Foundation on the condition that more European experts should be involved. This led to the development of a much more diverse and more comparative approach to segmentation theory than initially envisaged.

The differences between the Cambridge approach and the two US schools of segmentation theory hinged around two issues that were central to Frank's theoretical perspective. First, the non-US contributors were concerned not only with the capital-labour division of interests but also with intra-capital and intra-labour divisions. Second, they rejected the functionalist approach where lines of segmentation were solely or primarily shaped by the interests of capital. Thus, Doeringer and Piore's (1971) dual labour market theory held that it was the need to retain workers with firm-specific skills that led to a divide between primary and secondary labour. Trade unions exerted some influence on the creation of primary labour markets but were mainly only able to organise those groups that the employers' side were also keen to retain and stabilise. The analysis of Edwards, Reich and Gordon (1975) took a similarly functionalist approach but from a Marxist perspective: capital was argued to act collectively to divide and rule the working class through the segmentation of the employment system. The parallel work by Harry Braverman (1974) on the labour process was also based on an analysis of the interests of capital acting collectively, without active resistance by workers or trade unions (Rubery, 1978).

In contrast, Frank's research on the development of the steel industry in the UK, particularly in comparison with the US steel industry, led him to develop a more complex and historically-rooted approach to understanding the patterns of segmentation, and the associated form of the labour process in particular countries or sectors. The founding principles of this approach are succinctly stated in his 1979 introduction with Elbaum et al. (1979) to the special issue on the steel industry in the *Cambridge Journal of Economics*.

Our research suggests that three basic sets of relationships influence the development of the labour process: relationships between capital and labour, among capitalists, and among groups of workers. An enlargement of the scope of the analysis of the labour process is called for to consider the details of these relationships and the interaction between them (ibid., pp. 227-8).

This triple-tier framework reflected Frank's interests and research into the historical patterns of change in both industrial and trade union organisation in sectors such as steel, mining and construction. This approach provided a basis for specific critiques by the Cambridge Labour Studies Group of the emerging Marxist and pluralist theories that were dominating debates on both the labour process and labour market segmentation from the early to mid-1970s (Rubery, 1978; Elbaum and Wilkinson, 1979; Wilkinson, 1981). The development of these critiques was markedly enhanced by the opportunity to interact with other European scholars who brought with them not only similar interest in this more historical and multi-layered segmentation theory but also viewed these developments through the lens of the specific and very different institutionalised employment system in their own country. Thus, at the first IWPLMS conference in 1979 Werner Sengenberger's analysis of segmentation in Germany

was based around the importance of skill, as shaped by the dual training system in Germany (Sengenberger, 1981). At the second conference in 1980, Francois Michon's analysis of segmentation in France focused on legal changes and the growth of non-standard employment (Michon, 1981); and Sebastiano Brusco's contribution on Italy explored differences in work between the small firm based industrial districts of north-east and Central Italy known as the 'third Italy' and the heavy industry and large firms of the Italian north west known as the first Italy (Brusco and Sabel, 1981; Brusco, 1982).

These contributions preceded, by around two decades, publication of the "Varieties of Capitalism" model (Hall and Soskice, 2001) which now dominates comparative research. Yet at this juncture, there was relatively little awareness, outside of national boundaries, of the dominant importance of skills in Germany, of state regulation in France and of industrial structure in Italy. The Societal Effect School (Maurice et al., 1986) from France and Germany had already started to develop a theoretical approach that took societal-specific institutionalised labour markets to be the norm and the IWPLMS attracted a range of scholars associated with this approach to its conferences.⁴ All of this provided grist to the mill for Frank's multi-layered and historical approach, which up to that point had been developed primarily through research in the UK, with some reference to divergent development in the United States.

Another strand of debate that emerged from the early IWPLMS conferences, that also chimed with Frank's methodological approach, was the increasing recognition that explaining stable patterns of segmentation between primary and secondary workers (the driver for Doeringer and Piore's work (1971)) was no longer the key question. Instead, there was a need to understand how divisions between workers were being used in reshaping the employment and industrial landscape. This change is reflected in the title of the first book to emerge from the IWPLMS, edited by Frank in 1981, "The Dynamics of Labour Market Segmentation". This coincided with the beginning of the widespread debate on labour market flexibility, with a founder member of the IWPLMS, Sam Rosenberg, publishing a paper with the International Labour Organization (ILO) in 1989, entitled "From Segmentation to Flexibility". In practice, the development of a dynamic analysis of labour market segmentation theory in its European form provided a strong foundation for understanding how flexibility in its various guises was being driven by intra- and inter-class forces of competition and change.

Frank's interest in segmentation was developed through a range of projects including one that was underway when IWPLMS formed – an investigation funded by the Department of Employment into six industries where wages councils had recently been abolished (Craig et al. 1982). This study helped to shape understandings of low wage labour markets and the role of legal and collective regulation. Other large-scale projects followed, including the UK Social Change and Economic Life Initiative (SCELI) during the 1980s and research into job insecurity at the end of the 1990s. The SCELI initiative had a major focus on the role of employers in shaping and reshaping labour markets that can be considered in many ways a response to the Cambridge Labour Studies Group's emphasis on the demand side of the labour market in creating and reshaping segmentation (Rubery and Wilkinson, 1994). This approach was in contrast to traditional theories of workforce divisions that emphasised supply-side issues. A major Joseph Rowntree Foundation project on job security and work intensification followed, led by Brendan Burchell who had joined the Cambridge Labour

⁴ For example, Jean Jacques Silvestre, one of the authors of Maurice et al. (1986) organised the fifth conference of IWPLMS and Werner Sengenberger, a founder member of IWPLMS, was associated with the work in Germany on societal effects led by Burkhardt Lutz.

Studies Group to work on the SCOLI project. This project focused on another aspect of Frank's approach to segmentation: its ever present tendency to change and evolve. In this case, the study revealed how fears of job insecurity had crept up the job hierarchy to affect managerial and professional workers (Burchell, Ladipo and Wilkinson, 2002). These changes were being driven by new patterns of capitalist competition and by changing labour market policies. Importantly, the feelings of job insecurity related not only to fear of unemployment and income loss but also to fear of losing valued job roles, status and promotion opportunities. In this way, the Cambridge approach recognised the importance of the dignity and value of labour to both society and the individuals who performed it.

The rejection of a grand theoretical narrative meant that there was a need for careful collection and analysis of evidence to better understand the workings of both successful and unsuccessful productive systems (which will be explored in greater detail in the section below). In Frank's work, this was achieved through the collection and analysis of historical and contemporary evidence, both qualitative and quantitative, on the inter-relationships of components of productive systems. The focus shifted between projects – sometimes on employers, sometimes on employees, and also at times on trade unions and professions – consistent with a productive systems approach that emphasised the importance of institutions. Perhaps the most distinctive of these surveys were those in which employers, trade union officials and employees within the same organisation were interviewed, revealing their different perceptions of the reality in and beyond their places of work; this method was pioneered by the Cambridge team in the SCOLI initiative during the 1980s (e.g. Burchell and Rubery, 1994), and repeated in the 1990s Rowtree project on job insecurity and work intensity (Burchell, Ladipo and Wilkinson, 2002). These projects were followed by other more modest surveys on professions (Lane et al., 2004; Burchell et al., 1999) and on trust (Burchell and Wilkinson, 1997). The fieldwork typically involved travelling to workplaces around the UK to interview both bosses and employees on their attitudes to, and experiences of, such things as job insecurity, pay, training, bargaining, trust and the intensification of work.

Use of interview techniques went hand-in-hand with a rejection of the methods often used by other economists, such as the simulation of quantitative evidence and subsequent econometric analysis. Consistent with Frank's rejection of the notion that the world could be adequately understood through an economic lens – and harking back to Frank's year studying anthropology at Cambridge before turning to economics – these teams were typically drawn from multiple disciplines including economics, sociology, social psychology, law and geography.

Alongside this detailed empirical research into labour markets, Frank would also further develop his focus on the dynamic development of productive systems as a core framework for understanding patterns of labour market division and change. This is the focus of the section below.

Productive Systems

Having rejected all over-arching ideological theories but acknowledging that “a theoretical and analytical framework is essential as a guide” (Wilkinson, 1983, p. 413), Frank wrote “Productive Systems” in 1983, for the *Cambridge Journal of Economics*’ memorial issue to Joan Robinson.

When it was first published, the ideas embodied in “Productive Systems” emerged from and were developed against the backdrop of the economics profession’s abandonment of Keynesianism. As economists debated the causes of the burgeoning crisis of the 1970s, they abandoned the Keynesian Revolution and returned to the pre-Keynesian neoclassical conventional wisdom in economics: that money determines prices and that the market determines everything else. These conclusions rested on the belief that there are laws of the market that exist prior to the laws of man, and that to optimise welfare, organisations and institutions must conform to them. The starting point for “Productive Systems” is quite the opposite conviction. Frank argued that in order to understand how economic systems *actually* operate, it is a fatal error to believe that organisations and institutions must comply with prior laws derived from theoretical constructs. Frank believed that institutions were, in fact, the driving force behind the evolution of productive systems.

The central proposition ... is that economic, social and political forces combine in determining how economies develop and that the result is a dynamic non-equilibrium process which can only be revealed by empirical investigation ... [T]here are and can be no universal, pre-determined, “true” systems to which underlying economic forces are tending (ibid., emphasis in the original).

Thus, “Productive Systems” lays out

broad guidelines formulated with the specific aim of improving our understanding of how economic systems operate in practice. This framework has been developed from empirical and historical investigation and from long discussions with others engaged in similar research. A central feature of this methodology is that the framework itself is to be tested and where necessary modified as a result of empirical findings (ibid.).

True to his word, for the rest of his life, Frank would revisit productive systems theory, refining it on the basis of the findings of his empirical and historical research. However, the basic framework would prove remarkably resilient. Rooted in Marxian and Marshallian understandings of the nature of productive organisation, the productive systems approach thus evolved as an influential alternative framework for the analysis of economic systems and their development.

The focus of productive systems theory is the effectiveness of the use of resources and the role of industrial organisation in securing this objective. But rather than viewing the various factors of production as substitutes, its starting point is recognition that the essence of production is mutual dependence, rooted in technical complementarities inherent to production. Co-operation thus emerges as centrally important to productive systems’ performance. This is because the exploitation of these dependencies requires full co-operation among those involved in production, which includes a sharing of information necessary for the improvement of production, products and processes. Co-operation also fuels the learning processes by which information and knowledge are created, incorporated and diffused, and from which new products, processes and organisational forms are developed. The resulting operational and dynamic efficiencies are crucial determinants of the ability of productive systems to compete effectively, to respond flexibly to changing circumstances and to create new opportunities. These efficiencies are also important because they generate the value added by productive systems, which forms the basis for the income and economic security of their stakeholders.

To explain how productive systems operate, Frank was careful to distinguish between the technical and social relations of production; here, there is a powerful Marxist legacy. He identified the technical relations as being the functional inter-linkages in production that exist between labour, equipment and materials; and the exchange of technical and other information pertaining to production and to the development of products and processes. He saw these as being objective and impersonal associations determined by the technicalities of products and the methods by which they are produced. By contrast, the social relations of production are subjective and personal associations among the human agents of production. Frank saw these as forming the social structure within which the technical relations of production are formed and the production tasks of labour and the means of production are organised and jointly undertaken. From this perspective, they play a central role in determining the effectiveness of technical co-operation.

In the context of production, the social relations have two main functions: coordination and control. Production coordination requires formal direction as well as less formal inter-personal relationships among participants in productive processes. Together, these constitute the social framework within which the agents of production are brought together into co-operative activity. The control function involves the exercise of authority and the imposition of sanctions necessary to secure effective technical co-operation, which operates at the formal and informal, inter-group and intra-group levels of organisation.

The social relations of production also served a third purpose: securing agreement about the distribution of jointly-produced value among those involved in production. However, whereas production is necessarily co-operative, distribution is essentially competitive because what is received by one of the partners to production is no longer available for distribution to the other(s). For self-seeking individuals, Frank accepted that material gain, rather than any sense of the common good, is what encourages them into co-operation in production. The social relations of production therefore have the dual and potentially conflicting functions of securing co-operation in production and agreement over the distribution of its rewards.

Frank viewed his concept of productive systems as having general application in providing a basis for analysis at any level: from the household; to production units, firms and industries; industrial districts, regions and countries; trading blocks; and the global economy. At each level, there are internal and external networks of mutually dependent relationships, the terms and conditions of which are determined by relative power. In this context, relative power involves an interplay of the strength each party derives from their position within the relationship; what they bring to the relationship as a consequence of their wealth, social, political and legal standing; and any other means by which relative power is determined. From this perspective each productive system, its internal relations, those it forms with other productive systems, and the terms and conditions for their formation and continuance are the unique outcome of its own history.

By conceptualising change in productive systems as a dialectical and non-equilibrium process in which social, economic and institutional elements dynamically interact in historical time, “[t]he interesting questions, therefore, are ... about the conditions leading to the emergence of different productive systems and the terms on which systems co-exist” (Wilkinson, 1983, p. 421). Frank identified the drivers of change as being developments in products and processes, and changes in productive and power relationships, both within and between productive systems. Together these interact with the broader economic, social and political framework, being modified in the process, with the potential to lead to the creation, radical modification or destruction of productive systems.

What is implied, therefore, is an evolutionary process determined by the way productive systems, and their relations with other productive systems, create their own environment and mutate in response to innovation in techniques and organisational forms as well as shifting power relationships. Because the productive systems approach implies a non-equilibrium process, productive system development cannot be said to be tending towards an optimum or indeed anywhere else. Rather, the most that can be said is that a productive system is relatively successful or unsuccessful at any point in time.

A relatively successful productive system is likely to have comparative advantage in its overall economic, technical, political and social organisation, and to be at the forefront of technical and organisational progress. In this context, the growth of productivity and the possibility of securing favourable terms from other productive systems with which it deals, have the potential to help increase the system's wealth and reduce internal conflicts that could impede co-operation. The outcome is a potentially virtuous cycle of increasing productivity, competitive success, growth in demand and rising prosperity.

By contrast a relatively unsuccessful productive system is likely to be one where the pace of technical advance is slow, productive forces are ineffectively utilised, and systems of management, control and industrial structure are ineffective. Together, these can be expected to reinforce competitive failure. In such productive systems, the consequential slow rate of wealth creation has the potential to intensify distributional struggles, hindering co-operation in production and the ability of the socio-political system to find effective solutions by organisational and institutional reform. In this hostile environment, the productive system will find itself under severe pressure; but any resulting social, political and economic crisis is unlikely to resolve the underlying causes of degeneration. On the contrary, the struggle over distribution and control could be expected to increase the system's inflexibility and hasten its decline.

In short, given the nature of productive systems and the central role they play in economic development, "[w]hat constitutes economic progress and an "efficient" distribution of income is essentially a political question because the objectives are political and social in character and not purely economic in the usual narrow sense of the term" (Wilkinson 1983, pp. 427-8).

While this framework was very much a product of the multiple influences on Frank's ways of viewing the world, it was strongly influenced also by his collaborations and discussions with Italian students and researchers, including Paola Villa, Giovanni Solinas, Margherita Russo and, above all, his close friend Sebastiano Brusco. Throughout his working life, Frank continued to be fascinated by industrial districts (You and Wilkinson, 1994; Keeble and Wilkinson, 2000), the key focus of Brusco's work.⁵ Frank's work on productive systems also took on a renewed lease of life when he started working with colleagues whom he initially met during his productive time as a visiting professor at the University of Notre Dame. This work was developed, in particular, with Sue Konzelmann,⁶ who came to the UK to work initially as a Research Associate in the Cambridge Centre for Business Research (CBR) and then at Birkbeck, University of London, where Frank also held an honorary position.

⁵ See, for example, Brusco, 1990; Brusco, 1982; and Brusco and Sabel, 1981.

⁶ See, for example, Birecree, Konzelmann and Wilkinson, 1997; Wilkinson, Konzelmann and Birecree, 2000; Wilkinson, 2003; Konzelmann and Wilkinson, 2016; Konzelmann, Craypo and Wilkinson, 2005.

Wage Determination, Productivity, and Labour Market Regulation

From his earliest writing, Frank was interested in processes of wage determination and their wider social and economic ramifications. In the late 1960s when he began his academic career, there was a consensus that the British system of industrial relations needed reform and modernisation. Industry-wide collective bargaining was seen as inflationary, and union militancy as an obstacle to investment and growth. Frank's response in reply to the question he posed, "Do Trade Unions Cause Inflation?" (Wilkinson and Turner, 1972) broke with conventional wisdom that it was trade unions' pursuit of higher relative wages that drove cost-push inflation, to instead point to the role of import price and tax hikes in eroding real wages. This approach was not well received in the then dominant Oxford and Warwick Schools of industrial relations research, with their focus on the workplace at the expense of the wider institutional context of the labour market and was ignored by policy makers.

At this time unions were all too readily seen as the cause of the country's deep rooted social and economic problems. It was the era of the Conservative government's ill-fated Industrial Relations Act (1971-4) and the Labour government's equally unsuccessful "Social Contract" (1975-78). Where the Conservative government tried to channel the collective bargaining process through top-down legislative intervention, which the unions resisted, its Labour successor sought to achieve wage restraint through voluntary pay norms, which the unions accepted for a while but then abandoned in the face of rising prices and the inability of social and fiscal policies to maintain household incomes. The failure of the Social Contract paved the way for measures of labour market deregulation and flexibilisation which dominated British policy-making from the election of Mrs. Thatcher's first administration in 1979. From there these policies spread around the world, becoming a global orthodoxy by the early 1990s. Frank was to devote much his long career to confronting the economic arguments on which these policies relied for support.

British industrial relations were indeed in urgent need of reform, but not of the kind which British governments were prepared to contemplate. Research conducted by the Cambridge Labour Studies Group of which Frank was a member and published in 1981 under the title *Labour Market Structure, Industrial Organisation and Low Pay*, showed that low pay was caused by the divergent development of industries and firms on the one hand, and on the other, the segmentation of the workforce by class, gender and other social factors (Craig et al., 1982). In place of the partial and selective system of minimum wages then operating through the wages councils, the Cambridge study made the case for establishing a universal floor through a national minimum wage, which trade unions would have a role in setting.

At just the point when this study was published, however, policy began to run in the completely opposite direction. The Conservative governments of the 1980s began a process of stripping away the powers of the wages councils, while passing laws to restrict union autonomy and the right to strike. By the early 1990s there was no statutory minimum wage left outside agriculture, and sector-level collective bargaining was in widespread decline. The economics profession, dominated by neoclassical equilibrium-based modelling, saw this as a necessary change: wages should be "flexible" in response to supply and demand shocks, with fiscal transfers ensuring that households received a living income.

Frank, however, maintained his commitment to pursue better employment rights and in 1989 became a founder member of a new labour law think tank, the Institute of Employment Rights. In papers written with collaborators including Peter Brosnan and Simon Deakin,

Frank argued that the policies being pursued in the UK would widen wage inequalities and impose an unsustainable fiscal burden on the state, with no countervailing benefits (Brosnan and Wilkinson, 1988; Deakin and Wilkinson, 1990). The removal of the sectoral wage floor, coupled with the use of tax credits to top up wages, was in essence a subsidy to low paying and less productive firms. Making social security more conditional was likely to lead to a growth in insecure and casualised employment, further eroding the tax base.

These trends were already visible at the time Frank's analyses appeared at the turn of the 1990s, and they were only to get worse over time. An opportunity to reverse them was missed in 1992 when a Conservative government was re-elected against expectations. The Labour party manifesto of that year had contained a commitment to introduce a statutory minimum wage along lines set out in a report which Frank helped to write, published by the Low Pay Forum, a network of academics, think tank-based researchers and trade unionists (MacNeill and Pond, 1988). This would have been a minimum wage pegged to median earnings and designed to rise over time to keep pace with both wage and price inflation. The statutory floor to wages was to have been complemented by labour law reforms aimed at reviving sectoral collective bargaining. This vision of a new minimum wage for Britain owed much to the example of wage determination systems on the European mainland and reflected the knowledge which Frank and his collaborators had gained through participation in the International Working Party on Labour Market Segmentation over the course of the previous decade.

When a Labour government was returned to office in 1997, a very different proposal for a national minimum wage quickly emerged. Prepared during the early "New Labour" years under the influence of the economic mainstream, this version of the minimum wage contained no automatic uprating mechanism. The Low Pay Commission, the statutory body charged with advising ministers on the level of the new statutory minimum, was instructed to attend to its wider economic effects on the assumption that these were likely to be negative if the rate was set too high. The members of the Low Pay Commission included economists and industrial relations specialists who, far from being advocates of a national minimum, had previously expressed scepticism towards the idea of statutory wage regulation. Meanwhile, the New Labour government's 1998 White Paper *Fairness at Work*, (Department of Trade and Industry 1998), extolled the virtues of a flexible labour market, and claimed that the UK's light-touch approach to labour market regulation was a source of competitive advantage. There was to be no return to sectoral collective bargaining, and the tax credit system, far from being curtailed, was massively expanded- altogether a triumph for the economic orthodoxy of the day. It did not take very long, however, for it to become clear that New Labour's labour market policy was not going to address any of the long-term structural problems of the British economy. The national minimum wage, while having no discernible impact on employment, did nothing to improve productivity either. Britain remained a low-wage economy in comparison to its European neighbours, and became an increasingly unequal society during this period.

These setbacks notwithstanding, Frank's collaboration with labour lawyers including Simon Deakin, Keith Ewing (professor of public law at King's College London) and John Hendy (a barrister and president of the Institute of Employment Rights), brought his ideas to a wider audience during the 1990s and the first decade of the 2000s. *The Law of the Labour Market*, published by Simon and Frank in 2005, had been initially conceived as a critique of deregulation policies (Deakin and Wilkinson, 2005). It morphed into a more ambitious project which sought to explain the long-run evolution of British labour and social security

law against the backdrop of the country's early industrialisation and subsequent uneven social and economic development. The book combined labour market segmentation theory with systemic and institutionalist theories of law. It attracted a readership which was both international and cross-disciplinary, spanning political economy, labour history, feminist theory and the sociology of law, and generated responses which helped to re-energise the field of labour law research (Dukes, 2014). Its vision of a labour market law founded on inalienable social rights is influencing contemporary debates on the gig economy, migration and the climate crisis. With scepticism towards flexible labour markets increasing, and the policy debate more fluid than it has been for some time, Frank's work has lost none of its relevance.

Conclusion

Through this exploration of Frank's main research topics, his key methodological, intellectual, empirical and policy contributions have been highlighted. Four main themes dominate.

First, his rejection of both equilibrium analysis and grand theorising resulted in sustained efforts to develop dynamic, dialectical and historically-informed analyses across all his main research fields. This approach called for detailed attention to the collection and analysis of evidence, both quantitative and qualitative, which he undertook through large-scale empirical projects and surveys and smaller-scale qualitative case studies.

Second, Frank's interest in the productive system as a site of both co-operation and conflict resulted in him contributing to the analysis of industrial and institutional organisation, on the one hand, and industrial relations and labour market segmentation, on the other. These disciplines increasingly diverge but for Frank, they were inextricably connected.

Third, he carried his conviction of the importance of understanding the actions and aspirations of the working class as the forgotten element in economic analysis into all parts of his work. For Frank, this approach filled a gap in the work of the Cambridge School of economics that had tended to shy away from political and class-related distributional issues. By bringing the working class to the fore, he argued for a much broader multi-disciplinary and politically and historically-informed social science, even though economics was the main discipline to which he always returned.

Fourth and finally, none of this activity would have been worthwhile for Frank if it had not provided a basis for him to contribute to key policy debates, and to use these contributions to strive to improve the lives of working people in the UK and elsewhere, a focus which he never lost throughout a long and hugely productive life.

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