A Tale of Two Trilemmas: Varieties of Higher Education and the Service Economy

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Introduction:

Since the 'golden era' of Fordist production in the postwar period (Marglin and Schor, 1990), the employment structure of advanced industrial nations has been altered, probably irrevocably. Where once manufacturing, agriculture, and other blue-collar workers accounted for over half the population, they now account for less than one fifth of the workforce in some states. Scholars looking at this shift, most notably Iversen and Wren (1998), have highlighted the challenges of sustaining wage equality as low-productivity services expand. Iversen and Wren, highlighting a set of trade-offs they refer to as a 'trilemma', note that there appears to have been a clustering of states into three camps: Anglo-American states that have developed a large low-paid, low-skill private service sector, Scandinavian states that have avoided this increase in inequality by employing low-skill workers in the public sector, and Continental states which have constrained the growth of the service sector, producing low-skill unemployment.

Intriguingly, a similar clustering of countries holds when we examine service sector employment trends for high skill workers. Anglo-American states have high levels of private service sector employment and high inequality among high-skilled workers. Scandinavian states have high levels of skilled public sector employment and more wage compression among high-skilled workers. Finally, Continental countries have both restricted high-skill service sector employment and sustained wage compression. However, the theoretical mechanism developed by Iversen and Wren to explain cross-national differences in the employment and wage inequality of low-productivity workers does not give us much purchase in explaining these similar patterns among high-skilled workers. Whereas wage compression at the bottom end of the wage distribution presents

the threat of unemployment, wage compression at the top end has no such impact - indeed firms would be happy to employ skilled workers for wages significantly below their marginal product (Acemoglu and Pischke, 1999; Stevens, 2001).

We argue that scholars need to view the expansion of the service sector and higher education systems as mutually constitutive. Although some services remain essentially unskilled – taxi-driving and check-out manning – others require high levels of education to enter, typically the credential of a university degree. The media, finance, government, education, health, real estate, consulting, and a whole host of other professions are essentially barred to workers without college degrees. Thus, if we want to understand the political economy of the service transition, we need to examine both the demand for university-educated labor from such services and the supply of this labor by the university system. Building off Ansell's (2008) distinction between elite, partially private, and mass public higher education systems, we argue that the institutional structure of higher education combined with prevailing wage compression determine the both the *level* of high-skilled service-sector employment and the *composition* of that employment.

In distinguishing among high-skilled services we focus on the distinction between 'dynamic' and 'non-dynamic' services (Wren, this volume). Whereas Iversen and Wren (1998) depict services as inherently low in their productivity growth, and hence candidates for suffering Baumol's disease – a host of services exist that can exhibit rather high levels of productivity growth and are potentially candidates for growing employment *and* wages. In particular, so-called 'FIRE' services (finance, insurance, real estate) are high value-added and have seen a large increase in their share of the workforce

in many OECD countries over the past few decades. Other less productive services have also increased their share of the workforce, including retail and catering (largely low productivity) and social services (often public or non-profit and consequently with unclear levels of productivity). There is a strong demand for college-educated workers not only from the dynamic sectors, which rely on the ability of employees to perform non-routine cognitive tasks (Autor, Levy, and Murnane, 2001), but also from a host of non-dynamic sectors which either focus on providing social services or public administration. Turning to labor supply, the incentive of graduates to pursue employment in either dynamic or non-dynamic services depends on the differential wages and benefits offered in these different professions and on the overall level of wage compression in the economy. Consequently, different institutional environments may channel university graduates into different areas of the service sector. In particular, where graduates must repay fees they will be more likely to seek employment in dynamic service sectors with less wage compression.

We begin this paper by noting the major changes in employment in the service sector generally, and more specifically in different forms of services, over the past twenty-five years. We then move to a discussion of the differences across OECD nations of skills supply, and here we expand upon the normal general / vocational split employed by political economists (for example, Estevez-Abe, Iversen, and Soskice, 2001) to outline the different modes of providing higher education, building off Ansell (2008). In the following section we develop a theory relating different service sectors to differing higher education systems. Here we argue that the first key distinction is between elite and mass enrollment higher education. In the former case, labor supply may not be adequate to

meet labor demand in dynamic service sectors (or potentially in the public sector) thereby restraining the move away from manufacturing. The second key distinction is between mass systems that employ tuition fees – partially private systems – and those where the full cost of higher education is carried by the state – mass public systems. When graduates face paying back fees, they will, all else equal, prefer jobs with higher salaries. Consequently, they are likely to be attracted to jobs in the dynamic service sectors, where productivity gains are high enough to sustain both increased wages and increased employment. However, in countries with high levels of wage compression, the premium for entering the dynamic service sector may be dramatically lower. Such states, consequently, are less likely to increase the role of private funding in higher education, since students will be unable to earn sufficient amounts to pay fees back easily. Consequently, we should see partially private systems associated with high levels of dynamic service sector growth but mass public systems associated with growth in non-dynamic services (especially the public sector) and potentially also graduate-intensive high-end manufacturing. To support these arguments we analyze two decades worth of data on higher education enrollment and service sector employment across 23 OECD countries. Using an error-correction model to estimate the determinants of employment in a variety of sectors, including the FIRE sector and non-dynamic services, we find contrasting effects of university enrollment in the mass public Scandinavian systems and elsewhere.

We conclude by exploring three broader implications of our argument for the study of social policy in the advanced industrial world. We argue that the standard distinction made in the comparative political economy literature between individuals with

general versus specific skills neglects an important distinction *within* the set of workers with general skills: those employed in dynamic private sector services and those employed in nondynamic and public sector services. This distinction has potential ramifications for preferences over social policy, for the relative productivity of the public sector, and for the stability of institutional configurations across countries. In particular, we argue that mass public, compressed wage, nondynamic service countries and partially private, dispersed wage, dynamic service countries form two self-reinforcing 'high skills equilibria'.

The Service Sector and Higher Education since 1980

In this section we discuss differences within the OECD, both across time and across countries, in the composition of employment and the structure of higher education provision. We argue in the following section that there are clear 'elective affinities' (Ebbinghaus and Manow, 2001) between employment patterns and higher education systems and, further, that differential levels of productivity across sectors and wage compression across countries are important intervening variables. Before establishing these causal connections, however, it is helpful to set out the broad patterns of variation in the labor markets of OECD states.

We begin by discussing the employment profiles of OECD countries with respect to various sectors that can broadly be classified as 'services'. Table One examines the relative shares of total employment in 1998 taken by two distinct branches of the service sector: so-called 'FIRE' (financial, insurance, and real estate) services and social

services.[1] FIRE services are a paradigmatic form of dynamic service – these sectors are often tradable, technologically driven, and have had fairly high productivity and wage growth over the past three decades. Social services, conversely, are a paradigmatic nondynamic or 'handicraft' sector. Creating productivity growth in social services is difficult since having a teacher or doctor 'serve' more people generally leads to a reduction in average service quality. However, technological advances in communications and data management mean that a broker, banker, or insurance agent, can process or handle many more clients than they were able to in the 1970s at relatively little reduction in service quality. Thus the employment patterns in FIRE services versus those in social services indicate the aggregate productivity in a nation's services output.

A striking cross-country pattern can be seen when comparing Anglo-American states with Scandinavian ones (shaded light grey and dark grey respectively). While the Anglo-American states all had levels of employment in FIRE services above the mean (sometimes considerable so), the Scandinavian states are all somewhat below the mean (albeit just under). Conversely, when one examines the levels of employment in social services, the reverse pattern holds. Here the Anglo-American countries are either under the mean or just over but the Scandinavain countries are all considerably above the mean. Yet both sets of states, as we shall see presently, have high levels of higher education attainment, an intensive input for both FIRE services and social services. When one examines the countries of continental Europe we see that they largely lag in terms of FIRE services (with the important exceptions of the Netherlands and Switzerland) and

[1] While this data is a little dated, it corresponds to the last year in our statistical sample in the empirical section of this paper. More recent data shows a fairly similar pattern in the ranking across countries.

they show considerable variation and hence no clear pattern with regard to social services.

<Table One About Here>

These patterns of employment in FIRE services, where the Anglo-American states have considerably higher levels than their Scandinavian and Continental counterparts, and social services, where the Scandinavian countries have substantially higher employment than the Anglo-American and Continental countries, have important implications for the distribution of wages. Since FIRE services tend to lack wage-bargaining and, at least in the case of the Anglo-American countries, often have minimal regulation, especially in terms of labor market entry and exit, they tend to produce substantial wage dispersion at the top end of the income distribution. In contrast, social services are often highly regulated in terms of entry and exit and are commonly unionized and / or in the public sector. Consequently, they tend to have much less wage dispersion at the top end. Table Two displays the ratio of the ninetieth to fiftieth percentile of the income distribution across the OECD in both 1985 and 2001. In many countries, enrollment in the university system has passed the fifty percent threshold, thus this indicator gives us a rough guide to the disparity in the earnings of university graduates.[2]

<Table Two About Here>

When examining wage dispersion, a similar pattern emerges as in the employment patterns shown in Table One, with the Anglo-American and Scandinavian countries separating from one another. In Table Two, all the Anglo-American countries have above

[2] There are two caveats to be made here. First, in some countries the real action is to be had in the top five or even one percent of the population, as shown in Piketty and Saez, (2006). Second, in countries where tertiary enrollment is less than fifty percent, the person at the fiftieth percentile of income is typically not a graduate. Still the measure provides a decent first cut at graduate wage compression.

average wage dispersion in 2001 and all the Scandinavian countries are below average. Intriguingly, this pattern has become more pronounced since 1985. Both the mean and the standard deviation of wage dispersion have increased, but this seems to have been driven by wage dispersion in the Anglo-American states rather than the Scandinavian ones, though both experienced a massive increase in tertiary enrollment during this period. This outcome suggests that expanded enrollment has had quite contrasting effects on wage inequality in these two sets of states. As before, the picture in the Continental countries is somewhat mixed but except for France they have fairly low to moderate levels of wage dispersion, with little change over the sixteen year period.

How then do employment patterns and wage dispersion link together with skills? Throughout this section we have highlighted the distinction in employment and wages, between three blocks of countries: Anglo-American, Scandinavian, and Continental. This grouping was not accidental. Ansell (2008) argues that these sets of countries correspond fairly closely to three types of higher education system prevalent in the OECD: respectively 'partially private', 'mass public' and 'elite' systems. Ansell argues that these systems emerge as choices made from a 'trilemma' of enrollment, subsidization, and overall public cost. 'Partially private' higher education systems are those where enrollment is mass, subsidization is partial (that is tuition fees are common), and consequently the public cost of the system is moderate. 'Mass public' higher education systems are those where enrollment is mass and the cost is fully publicly subsidized, hence producing a sizeable public cost. And finally, 'elite' higher education systems are those that are fully publicly subsidized but have low levels of enrollment, thereby

maintaining public cost at a moderate level.[3] Thus, there are two key distinctions among higher education systems: their level of enrollment, and the funding structure employed.

<Figure One About Here>

Figure One, taken from Ansell (2008), demonstrates the pattern of gross tertiary enrollment, subsidization, and total public cost as a percentage of GDP (the latter being the figure below the country name). It is noteworthy that the Continental countries cluster largely at the bottom left of the figure, with the 'elite' pattern of low enrollment and high subsidization, with the Scandinavian countries following the 'mass public' model of high enrollment *and* high subsidization, and the Anglo-American countries pursuing the 'partially private' model of high enrollment together with the use of private financing. Although this figure is static, since 1980s, the Anglo-American and Scandinavian states have moved in quite distinct paths, with the former moving to the northeast - expanding while privatizing – and the latter moving dead east – expanding without privatizing. In the next section we tie together this distinction among university systems with differences in wage compression, which combine to produce distinct outcomes in terms of the composition of service sector employment.

A Theory of Service Sector Transition and Higher Education Policy

How are wage compression, skills provision, and employment patterns related? In this section we argue that the labor market facing students on graduation, and the financial constraints imposed upon them by the funding structure of higher education,

[3] Ansell argues that partisan preferences determine transition between the systems, with left-wing parties introducing partially private systems and right-wing parties introducing mass public systems, thus reversing the standard left-right pattern of education policymaking. We abstract in this article from the partisan determinants of system choice and focus on the *effects* of higher education systems once in place.

determine their career choices. In particular, where wages are highly dispersed and students face tuition fees to repay, graduates are likely to enter dynamic private sector services, like the FIRE sector. Thus, partially private systems are likely to coincide with high levels of wage dispersion and dynamic service sector employment. In contrast, where wages are highly compressed and students have no university-related debts, they may choose to enter lower-paying careers that have greater non-pecuniary benefits or higher job stability: for example nondynamic services like the public sector or high-end manufacturing. Thus mass public higher education systems should be associated with higher wage compression and nondynamic service sector employment. Finally, where the university system remains constrained, fewer graduates will emerge in any case and thus employment patterns will remain tilted towards sectors that employ non-graduates, including general manufacturing.

Since the argument outlined above relates to wage compression and skills acquisition it is helpful to discuss the general literature on how differential productivity and the structure of wages impact employment trends. The basic insight relating differential productivity across industrial sectors and wage / cost creep was developed in Baumol (1968). Baumol argued that if wages are uniform across sectors with different levels of productivity growth, then over time per unit costs will increase in the sector with lower productivity and overall economic growth will eventually asymptote to zero. One potential way out of the bind of increasing costs in unproductive sectors would be to permit wages to vary according to the underlying productivity of the sector that workers are engaged in. In this case, wages in the unproductive sector will remain steady as wages in the productive sector rise, thereby causing a continual increase in inequality.

Iversen and Wren (1998) build off Baumol's insight to argue that as the service sector (which they assume to have essentially constant productivity) grows, states are faced with looming inequality if they permit wages to be set differentially across sectors. Iversen and Wren depict this challenge as posing a 'trilemma' for states. One 'solution' to the trilemma is to simply permit increased inequality. However, if states want to maintain wage compression they must face the problem that in low-productivity services the wage rate paid to workers exceeds their productivity. Consequently, if wages are not flexible downwards because of institutionalized wage compression, firms will react to the cost squeeze by reducing employment. Thus a second 'solution' to the trilemma is to allow increased unemployment. Finally, the state could pick up the slack by itself employing these otherwise unemployed citizens. However, this increase in public employment will produce major budgetary pressures, forcing deficit borrowing or tax rises. Hence the third 'solution' is to abandon budgetary restraint. Iversen and Wren argue that these three options mirror those taken by Britain, Holland, and Sweden, respectively, and by extension the neoliberal countries (the Liberal Market Economies of Hall and Soskice (2001), the Christian Democrat countries of Continental Europe, and the social democratic countries of Scandinavia (these latter two groups comprising the Coordinated Market Economies of Hall and Soskice).

Iversen and Wren's argument is an incisive and convincing analysis of the tradeoffs states face when considering the welfare of citizens in the bottom half of the income distribution. Those citizens must accept either lower private-sector wages, the risk of unemployment, or public employment depending on the choice within the trilemma. However, wage compression is not solely a phenomenon that impacts low-

wage workers. In most cases, states with wage compression also have lower inequality in the top half of the income distribution. There are a number of potential causal mechanisms that might reduce the rightward skew of incomes among the richer half of the workforce. Firstly, where centralized wage bargaining includes most workers, the more productive workers under these bargaining arrangements will be paid less than their marginal product.[4] Second, greater degrees of financial, legal, and corporate governance regulation may prevent wages in the top percentile of income from rising dramatically higher than the rest of the economy (Blanchard and Giavazzi, 2003; Pagano and Volpin, 2005). Thirdly, the economy may be specialized in goods where an individual's effort or abilities are less 'scalable', that is where there is less of a 'winner takes all' dynamic (Frank and Cook, 1995). Finally, the tax system may be such that high income workers are disincentivized from further investment or skills acquisition because of punitive taxation of extra income (Heckman, Lochner, and Taber, 1998). Under any of these conditions, individual productivity may not be accurately reflected in individual wages just as in the case at the lower end of the labor market. However, the key difference is that whereas for lower productivity workers their wages exceeded their productivity, for the high productivity workers their wages are lower than their productivity, thus creating a 'skilled wage gap'. Figure Two below sets out this logic.

<Figure Two About Here>

As with Iversen and Wren, the gap between wages and productivity has implications for the welfare of workers. However, in this case, our interest turns to

[4] Acemoglu and Pischke (1999) build on this insight to suggest that under imperfect labor markets because firms can pay productive workers less than their marginal product, there is a greater incentive to train them in both specific *and general* skills. This might suggest a substitution effect between wage compression and university enrollment (since firms provide more training). However, this potential negative relationship does not appear to have occurred in Scandinavia.

workers at the top end of the productivity / income distribution, and consequently, the higher education system plays a significant role. In particular, the structure of wage compression in the economy will have two effects on the demand for and supply of higher education. Firstly, since wage compression limits the potential upside to higher education we should expect fewer would-be students to choose to enter higher education and thus a lower supply. Furthermore, if the wage compression is itself a result of regulated product or financial markets there may be reduced demand for workers with higher education since dynamic service sectors are likely to be more constrained in highly regulated markets. Thus, in states with high wage compression students are disincentivized from attaining higher education and there is lower demand for workers with higher education because wage compression tends to accompany limited dynamic service sectors. This pattern might even produce an equilibrium where the lack of supply of higher educated workers onto the labor market constrains the dynamic service sector from expanding due to scarce inputs of skilled labor. Thus many states with high levels of wage compression will also retain elite higher education systems.

Secondly, even where countries with high wage compression do have mass higher education systems, it is likely that expansion of higher education will be done through public funding - the mass public model – rather than tuition fees – the partially private model. Where students must repay tuition fees (either through a post-graduation tax system as in the UK or through subsidized private loans as in the USA) they are likely to prefer, all else equal, to enter into higher wage sectors. Entering non-dynamic service sectors will mean lower wages and greater difficulty in repaying loans. Consequently, in

partially private systems we should see a greater supply of graduates into the dynamic service sector than the non-dynamic service sector.

What happens, however, if the potential wages available in the dynamic service sector are limited by wage compression? In this case the wage differential between dynamic and non-dynamic services will be reduced. Students paying tuition fees off would struggle in both dynamic and non-dynamic services because of this compression. Consequently, wage compression and partially private systems will be an unwieldy combination. Instead, in countries with wage compression a mass public model of higher education is more likely. What is the impact of a mass public system of higher education on the pattern of sectoral employment in services? Wage compression itself disincentivizes the entry of graduates into the dynamic service sector relative to other sectors. Indeed, if we add the assumption that non-pay benefits may be higher in non-dynamic sectors, particularly the public sector, for example better hours, more holiday time, better pensions, then wage compression is likely to lead to greater entry of graduates into non-dynamic sectors. Thus mass public higher education systems should produce an influx of graduates into degree-requiring non-dynamic sectors. The classic example of a non-dynamic service profession is the civil service, since productivity is essentially unmeasurable in the public sector. Other such professions include education and social services.

Thus to recap, in countries with high levels of wage compression at the top end of the income distribution, higher education systems are likely to be smaller and where mass are likely to be the fully publicly subsidized. In countries without wage compression, partially private systems are more likely to emerge. The economic implications are that in

the latter case dynamic service sectors expand dramatically, whereas in the former two cases their expansion is retarded or reversed. Differentiating mass public from elite systems, we expect the former to have increased employment in degree-requiring nondynamic services, particularly public administration and education.

Figure Three demonstrates some of the trade-offs between public sector and dynamic services employment in countries with and without wage compression, assuming a mass higher education system.[5] Along the horizontal axis we array citizens by their productivity, assuming that higher productivity citizens are the recipients of higher education (the vertical line represents the 'threshold' level of productivity of the marginal citizen entering higher education in a mass system). The vertical axis represents the wages earned by individuals. Finally, there are two lines relating individual productivity to wages: one for countries with wage compression and the other for countries without wage compression. Both lines are upward-sloping, reflecting the positive effect of productivity on earnings. However, in countries with wage compression the effect of individual productivity on wages is 'flatter' than in countries without wage compression. We also assume that higher education adds a productivity 'bump' for individuals (that is, its human capital is valuable). Furthermore we also assume that the public sector offers a flat wage to graduates that is higher than the expected private sector wage of the lowest productivity graduate but substantially lower than the expected private sector wage of the highest productivity graduate. We assume that graduates choose to enter the public sector

[5] Figure Three displays only a partial equilibrium. For example, the tax costs of higher education are assumed away, as are the incentives of employers to invest in dynamic services. Consequently, the implications of the figure should be considered illustrative rather than indicative of closed form general equilibrium solutions.

(that is we allow public sector employment to vary) if the wage they receive is higher than that available on the private market.

<Figure Three About Here>

Some simple implications emerge from the figure. Firstly, since there is a smaller impact of individual productivity on wages in countries with a compressed wage structure, more graduates find employment in the public sector attractive than is the case in countries with no wage compression. Consequently, wage compression produces a larger public sector. Secondly, the average rates of individual productivity are higher in both the public *and* private sector in the country with wage compression. This counterintuitive result emerges because whereas only Group A in the figure join the public sector in states without wage compression, Groups B and C - twice the number of individuals – do so in countries with wage compression. Since the average individual in B and C has higher productivity than the average individual in A, the public sector should have higher productivity workers in countries with wage compression and high university enrollments (the Scandinavian 'good governance' effect).[6] Similarly because only the most productive workers seek private sector employment in countries with wage compression, average productivity is also higher here, though the sector is substantially smaller. A third implication is that if individuals must pay fees for their higher education, their paychecks will be significantly more squeezed in states with wage compression, since any large uniform cost paid by graduates potentially reduces their net wage below the level attainable without a degree. Consequently, in equilibrium countries with wage compression *and* mass enrollment will likely fully subsidize higher education.

[6] We discuss this governance effect further in the conclusion.

Turning away from services momentarily, what is the predicted impact of the three types of higher education system on manufacturing employment? Most political economists consider manufacturing to be reliant on a mix of unskilled labor and vocationally trained skilled labor. Hence the role of universities has been largely neglected (for example, in Hall and Soskice, 2001). The decline in the employment share of manufacturing in advanced industrial nations has been attributed to a mix of global competition, particularly driven by easy access to unskilled labor in the developing world (Wood, 1995), skill-biased technological change (Goldin and Katz, 1996) and the Baumol effect of differential productivity pushing people into the service sector (Iversen and Wren, 1998). These forces have together all worked against the position of unskilled labor in manufacturing, driving it into low-paid non-dynamic services – the story told by Iversen and Wren (1998) and Iversen and Cusack (2000). Further, as individuals who might once have left education following secondary schooling choose instead to enter university, we would expect the available labor pool for manufacturing to decline. Consequently, only in Elite university systems would we expect manufacturing employment to remain relatively stable (or, more pessimistically, to decline by less).

Skilled vocational labor occupies an ambiguous position – global competition is less fierce here and skill-biased technological change may favor this group, however the stagnation and decline of demand for manufactured goods leaves this group in stasis. The effects of university enrollment increasing should however have a similar effect to that on unskilled manufacturing employment – the reduction in the available labor pool reduces relatively the size of the skilled manufacturing employment cohort. However, there is also a third group employed in manufacturing – general skilled labor, that is, university

graduates. This group is employed in management, design, logistics, and other 'symbolic' or cognitive nonroutine functions (Autor, Levy, and Murnance, 2003). However, given their higher wages, they are likely to be hired mostly by expanding manufacturing sectors: high-technology manufacturing, which is the sector least threatened by developing nation competition and most favored by skill-biased technological change.

Thus we should expect that as higher education expands, manufacturing employment to decline generally but potentially to increase in high-tech manufacturing, the one sector amenable to graduate employment. Consequently, countries with elite systems of higher education will generally have a smaller decline in manufacturing employment than those with mass systems. However among mass systems there may also be differences, along the lines of that which we saw in services. Making the assumption that dynamic services on average pay better than high-technology manufactures, wage compression again affects the choices made by graduates. Wage compression reduces the wage differential between dynamic services and manufacturing for graduates, thus leading more graduates to enter the latter sector, particularly if manufacturing retains some non-wage advantages over dynamic services, for example, job stability (see OECD 2001 for supporting evidence on job tenure). Since graduates are most likely to end up in high-technology rather than low technology manufacturing, we argue that mass public systems may promote employment in high-technology manufacturing, though not manufacturing more generally, and that partially private systems will see little shift to employment in high-technology manufacturing since graduates remain more attracted to dynamic service sectors. Table Three summarizes this argument:

<Table Three About Here>

The Empirical Analysis of Higher Education and Service Employment:

The theory developed above suggested that both the *size* of a state's higher education system and its *funding structure* are likely to impact the employment decisions made by citizens. More precisely, the shift towards service employment should be more pronounced in states with high levels of university enrollment, and the ratio between employment in dynamic services with low wage compression (in particular the FIRE group of services) and nondynamic services with high wage compression (in particular, public sector jobs) should be higher in states who transition to a partially private mass higher education system than those who transition to a mass public system. In this section we assess the empirical validity of these hypotheses. We begin by graphically examining some suggestive differences in the bivariate relationship between tertiary enrollment and employment in various sectors, contrasting partially private and mass public systems. We then move on to inferential statistical analysis of the effects of enrollment on employment choice, using an error correction model to provide estimates of these effects for 23 countries from 1980 to 1998. In both analyses we show a striking distinction between the employment paths followed by states with partially private as opposed to mass public higher systems and between both of these groups of states and those countries who retain restricted higher education enrollment.

The data we use in this section on gross tertiary enrollment comes from the shared UNESCO / EdStats database of education statistics (UNESCO, 2008). Gross enrollment is not a perfect indicator of the proportion of students in a cohort who attain a full university degree. Rather it is calculated as the 'number of students enrolled in tertiary education *regardless of age* as a percentage of the population of the five-year age group

following on from the secondary school-leaving age' (UNESCO, 2007). This contrasts with measures of net enrollment, which provide a more direct measure of the proportion of a given age group in a particular level of education. However, UNESCO does not have reliable net enrollment data for tertiary education. Gross enrollment figures are fairly reliable *within* countries across time, since they show the generalized expansion (or more rarely contraction) of enrollment but they do present some difficulties in cross-national comparison. In particular, states where students take longer than five years to complete degrees (as is fairly common in Continental Europe and to a lesser degree Scandinavia) are liable to 'double-count' such students. Similarly, students taking second degrees, or those who fail to graduate may be counted in erroneously in gross enrollment figures. These caveats aside, the gross tertiary enrollment data has excellent cross-time coverage for around two dozen OECD states and, as noted above, *within-country* changes do appear to be reliable.

To measure sectoral employment patterns we use the OECD's Structural Analysis (STAN) database (OECD, 2008), which provides estimates of the employment share of various manufacturing and service sectors for a broad group of OECD states. In particular we focus on employment in the so-called FIRE services (finance, insurance, and real estate), social services (education, health, public administration, etc), high-technology quasi-services (communications, ICT), and high-technology manufacturing. In the statistical analysis we examine the effects of enrollment on both employment levels (that is the sector's share of total employment) and employment ratios (the share of one sector relative to another). In the statistical analysis we also employ measures of per capita

income, government spending, and trade openness as controls: these variables are all taken from the World Development Indicators database (World Bank, 2008).

Before turning to inferential analysis, we briefly demonstrate some descriptive patterns that highlight the choices faced by countries with mass higher education systems.[7] Figure Four below demonstrates the differential paths taken by countries with mass public higher education systems and those with partially private higher education systems with respect to employment patterns. The figure displays the change from 1980 to 2000 in gross tertiary enrollment and in the ratio of FIRE (dynamic) services to all services in employment. Eight countries are examined. Four are from the mass public group: Denmark, Finland, Norway, and Sweden. Four are from the partially private group: Australia, Canada, Great Britain, and the United States. While this graph is selective in terms of the countries analyzed and descriptive rather than inferential in its implications, the difference in the relationship between enrollment and FIRE employment across the two groups is striking.

The first noteworthy pattern is that, except for the cases of Australia and Denmark, all the countries with partially private higher education systems (or those that developed them between 1980 and 2000) had higher levels of FIRE sector employment in relation to overall service employment than did the countries with mass public systems in both 1980 and 2000. Thus cross-sectionally, there has long been a marked difference in the patterns of employment across the systems. However, despite the 'lead' of the partially private countries in 1980 in terms of relative employment in FIRE services, they gained more in this ratio between 1980 and 2000 than did the mass public countries. All

[7] We engage directly with the differences between countries with mass systems and those with elite systems in the inferential analysis.

countries massively expanded their levels of tertiary enrollment (the minimum being the USA with a 25 percent point expansion, the maximum being Finland and Australia with expansions over 50 percent points). However, this expansion of graduate production in the partially private system had a much more marked impact on employment in FIRE services than did the expansion in the mass public systems (with the possible exception of Sweden). Even though the partially private states had higher original levels of FIRE employment they expanded more deeply in this sector than did the mass public countries.

<Figure Four About Here>

Figure Five presents a similar analysis for the ratio of service employment to manufacturing employment. Here we see a similar set of patterns to the previous figure. In the partially private systems the impact of increased enrollment on the ratio of services to manufacturing employment has generally been steeper. In particular, contrast Australia and Finland. Both had similarly dramatic increases in their levels of tertiary enrollment between 1980 and 2000. And both did see the level of employment in services increase compared to that in manufacturing. Yet, in Finland, this ratio increased only from 2.2 to 3.3 - a fifty percent increase, whereas in Australia the ratio increased from 3.2 to 5.9, an eight-five percent increase. In every case, bar one – the comparison between Norway and Australia – the apparent impact of increased enrolment on the service to manufacturing ration was steeper in the partially private states than in the mass public ones.

<Figure Five About Here>

We now begin our statistical analysis of the impact of differing higher education systems on employment in various service and manufacturing sectors. As in Iversen and Wren (1998) we use an error-correction model (ECM) to estimate the effect of various

variables including university enrollment on changes in employment. The ECM is appropriate for handling situations where the dependent variable is approaching equilibrium, as one would expect with employment composition, and where there are concerns about unit roots in the time series (DeBoef and Keele, 2008). The ECM model incorporates a lagged dependent variable and both lagged levels and period changes in each of the independent variables. The lagged levels are presumed to estimate 'permanent' effects of each independent variable on employment, whereas the period changes (that is the gap between the current and lagged levels of the independent variable) estimate 'temporary' effects of recent shocks to the independent variable. We also include fixed effects for each country and adjust for autocorrelation of degree one in the error term. Thus the estimating equation is:

$$Employment_{it} = \beta_0 + \beta_1 Employment_{it-1} + \beta_2 IV_{it-1} + \beta_3 \Delta IV_{it} + ... + u_i + \upsilon_{it}$$
$$\upsilon_{it} = \rho \upsilon_{it-1} + \varepsilon_{it}$$

In the first set of estimations, shown in Table Three we analyze the share of employment in each sector as a percentage of the total workforce. Following this set of estimations we then examine the ratio of shares of employment in Table Four (for example, the ratio of FIRE services employment to manufacturing employment).

In both tables we differentiate between increases of enrollment generally and those occurring in the mass public systems of four Scandinavian countries – Denmark, Finland, Norway, and Sweden – which have the highest levels of public spending on higher education in the OECD. We interact both the lagged level and change in enrollment with a dummy variable for these countries. Thus to interpret the coefficients attached to these interactive variables one must add them to their non-interacted counterparts. For example, the effect of lagged enrollment for Scandinavian states equals

the coefficient for lagged enrollment for all states added to that for the interaction of lagged enrollment and the dummy variable for Scandinavia.

Table Four presents estimations for the effects of university enrollment on the share of total employment taken by a variety of sectors: the total service sector, FIRE services, social and community services, education, retail and catering, retail, total manufacturing, high-tech manufacturing, and information and communication technologies. Model 1 examines the effects of enrollment on the service sector writ broadly. Here we see a generally positive effect of expanding enrollment both in terms of the permanent and temporary effects on employment in the service sector, though the coefficient on the lagged level of enrollment is not statistically significant at conventional levels. This is countered by a negative effect, significant at the ten percent level, of enrollment on the share of employment taken by the service sector in the Scandinavian states, an impact that more than cancels out the overall positive estimation across the sample. Thus there is some borderline significant evidence that there is a divergent effect of enrollment in higher education on service employment across the Scandinavian countries versus the remainder of the sample.

This evidence becomes much more robust in Model 2 which examines the share of employment in dynamic FIRE services. Here there is a strong positive effect, significant at the one percent level, of enrollment on employment in FIRE services across the sample. A country that increases its enrollment by fifty percent points (a major shift to be sure but one undertaken by both Australia and Finland) is estimated to have a long-run increase in employment in FIRE services of 4.32 percent points (which represents a

fifty percent increase for the typical state in 1980).[8] However for Scandinavian states (like Finland) undergoing this shift in enrollment there is a countervailing effect, significant at the ten percent level, which cancels out this increase. Consequently, enrollment is not estimated to have *any* substantive impact on employment in dynamic services in these states.

So where are graduates heading in Scandinavian states? The next two models help address this question. Model 3 examines employment in social services and Model 4 examines employment in education, a subset of that group. In Model 3 the coefficients on the lagged levels of enrollment in the full sample and in Scandinavia are both positive but not statistically significant. However, if one examines solely education employment we do see a positive effect significant at the ten percent level both in the full sample and for the Scandinavian countries. This implies that overall increased higher education enrollments lead to an increase in employment in the education sector and furthermore that this increase is *more* pronounced in Scandinavia. While these results are only borderline robust and should be treated with appropriate caution, we can derive the estimated effect of a fifty point increase in enrollment as producing a 0.61 percent point increase in the workforce employed in education in the full sample and a 1.48 percent point increase in Scandinavia. This is a substantively large effect – since the mean share of employment taken by education is 6.37% in the sample, this implies a ten percent increase in the full sample and (from a regional mean of 6.91) a twenty-one percent increase in Scandinavia.

[8] Long run estimates are calculated by ignoring the temporary effect on the change variable and dividing the estimated coefficient on the lagged level of enrollment by one minus the coefficient on the lagged dependent variable and then multiplying by the example of a 0.5 increase in enrollment (where enrollment varies between zero and one).

Models 5 and 6 turn to the low-skill service sector, focusing on retail and catering (Model 5) and retail alone (Model 6). Here we see little impact of enrollment in the full sample but a strong negative effect of enrollment on employment in the retail sector in Scandinavia. Model 6 estimates that a fifty percent increase in enrollment would be associated with a decline in retail employment in Scandinavia of 2.3 percent points, implying a seventeen percent decrease in the average level of retail employment in that region. Finally the last three models examine manufacturing, in general in Model 7, and then at the high end in Model 8 (high-tech manufacturing) and Model 9 (information and communications technology). With manufacturing we see a striking pattern. Expanding enrollment in the full sample is associated with a highly robust and dramatic decline in manufacturing employment. Our benchmark of a fifty point increase in enrollment produces an estimated decline of 5.85 percent points in manufacturing, a decline of almost thirty percent in the average level of manufacturing. However, in Scandinavia, the effect of higher education enrollment on manufacturing decline is much smaller, at most 1.61 percent points. The difference in the effect of enrollment on manufacturing between the full sample and Scandinavia is striking and robust at the one percent level.

A similar difference emerges when we focus solely on high-tech manufacturing. Here, there is no measurable effect of university enrollment on employment in high-tech manufacturing except in Scandinavia, where there is a fairly sizeable and statistically robust impact. In fact, because of high levels of correlation between the dependent variable and its lag, the long-term measure for Scandinavian states is extremely large. Because of this powerful time dependency it is perhaps more helpful to look at the one period estimate – a 0.222 percent point increase, which amounts to a one period increase

of over fourteen percent in the share of the workforce devoted to hi-tech manufacturing in Scandinavia. A similar pattern emerges with ICT employment. Again there is no estimated effect of enrollment in the full sample but in Scandinavia there is a strong positive impact of higher education on ICT employment. Again the long-run calculated effect is extremely large because of high time-dependency in the estimation. Consequently it is more useful to examine the short term estimated effect of .178, which amounts to a one period sixteen percent increase in ICT employment. We must be careful in interpreting the magnitude of the estimated effects in Scandinavia produced by Models 8 and 9 because of the high time dependence. However, what does seem striking is a clear and robust difference in the trajectory of graduates as regards these high-end manufacturing jobs in comparison to the rest of the sample.

<Table Four About Here>

Table Five continues our analysis of the effects of higher education enrollment on employment, this time focusing on the ratios of employment in different sectors. This analysis is helpful since in the theoretical sections above we focused theoretically on the importance of tradeoffs and choices that graduates make across professions and that businesses make when viewing the size of the pool of graduates. The results here are complementary to those in Table Four so we shall discuss them somewhat more briefly. Our focus in particular is on the changes in the relative share of dynamic FIRE services compared to other sectors. We begin however with an estimation of the ratio of employment in the service sector to that in manufacturing. We see here the same pattern as in Table Four: increased enrollment leads to a shift to services in the full sample but no noticeable shift in Scandinavia. Model 2 shows that much of this effect comes from the

dynamic FIRE services. While in the full sample a fifty point increase in enrollment has a long run estimated effect of almost two standard deviations towards FIRE services in the full sample, in Scandinavia the impact on the ratio of FIRE to manufacturing jobs is nil. In fact, Model 3 indicates that in Scandinavia there is a statistically significant shift towards high-tech manufacturing and away from FIRE services when enrollment increases. All three models show extremely statistically robust results.

Models 4 and 5 turn to examining the ratio of social services to manufacturing (Model 4) and total services (Model 5). A couple of interesting patterns emerge here. While enrollment in the full sample is related to a relative decline of manufacturing with respect to social service employment, there is no such change in the Scandinavian sample. In fact, when we examine Model 5 we see that social services have been declining as a proportion of all services in the full sample, though this effect appears to be less pronounced in Scandinavia. Model 6 shows that it appears to be FIRE services driving this decline in social services, since in the full sample higher education enrollment is positively related to an increase in the share of service employment taken by dynamic FIRE services. There is again some evidence that this pattern is not occurring in Scandinavia, since the sign on the coefficient for enrollment for Scandinavian states is reversed, although not quite robust at conventional levels.

The final three models demonstrate further the trade-off *between* services hinted at in Models 5 and 6. Model 7 examines the ratio of FIRE employment to employment in education. Model 8 examines the ratio of FIRE employment to employment in public administration. Model 9 examines the ratio of FIRE employment to employment in healthcare. In both Models 7 and 8 there is a similar pattern – as university enrollment

expands in the full sample, the ratio of FIRE service employment to respectively education and public administration increases. However in Scandinavia expanded enrollment actually decreases this ratio of FIRE services to education employment and at least counteracts most of the shift in the ratio of FIRE employment to public administration employment. Put simply, expanded university enrollment in most states leads to a relative expansion of dynamic services with respect to nondynamic skilled services. However, in Scandinavia, expansion of university enrollment leads to a relative increase or at least stasis in nondynamic services. Model 9 shows one exception to this rule, examining the ratio of FIRE services employment to employment in healthcare. Here the coefficients have the same signs as in Models 7 and 8 but are statistically indistinguishable from zero. That is, changes in healthcare employment relative to dynamic services employment do not appear related to university enrollment. This is likely to be related to the general growth in healthcare employment across all OECD states, despite differences in university enrollment, caused by demographic shifts and technological change.

In summary, the empirical analysis of changes in the composition of employment across OECD countries shows a powerful but conditional impact of university enrollments. Generally, increases in enrollment should reduce manufacturing employment and increase employment in the service sector. However, this pattern is substantially more complex in Scandinavia, the home of the mass public higher education system. Whereas in most countries, university expansion has led to an increase in dynamic services and a relative decrease in nondynamic services, the precise opposite has occurred in Scandinavia. Moreover, in Scandinavia, manufacturing employment has

suffered relatively less from changes in the distribution of education than elsewhere; indeed, high-end manufacturing and quasi-services like communications have actually increased following enrollment expansion. Broadly, there appears to be substantial evidence that increased university enrollment has quite distinct effects on labor markets across the OECD, suggesting a powerful relationship between the trilemma of university systems and that of service employment.

In Conclusion: Three Implications for the Study of Social Policy

The analysis in this chapter suggests a powerful conditioning impact of both wage compression and higher education institutions on changes in the structure of modern labor markets. In particular, we have highlighted both the profound effect that university enrollment in general has on employment in the service sector, and more specifically, how different university funding structures condition what types of services develop. Whereas mass enrollment generally increases employment in dynamic services like the FIRE sector, in Scandinavian countries, graduates appear to be channeled into non-dynamic services in the public sector or into high-end manufacturing. We argue that the prevailing level of wage compression, by affecting the career decisions of graduates, conditions this process. Whereas mass partially private higher education systems are associated with wage dispersion and increased employment in dynamic services, mass public university systems are associated with wage compression and increased employment in non-dynamic services. Conversely, countries that retain elite university systems, by and large, are those where employment in the service sector lags. Within the advanced industrial world then, there appears to be a relationship among higher

education, wage compression, and employment trends. In this concluding section we explore some further implications of these clusters for our understanding of social policy preferences, the quality of governance, and finally for institutional stability.

Preferences over Social Policy: Much recent work has emphasized the link between the distribution of skills and support for social spending across OECD countries (Iversen and Soskice, 2001; Estevez-Abe, Iversen, and Soskice, 2001). This work focuses on the distinction between workers with general skills and those with firm specific skills, arguing that the latter will support more extensive systems of social protection because their attachment to a single firm makes them more risk averse. The expansion of higher education raises a number of questions for this framework. Does expansion of higher education reduce the relative importance of specific skills, which are associated with pre-tertiary vocational training, for defining social policy preferences? Do graduates from partially private higher education systems have different preferences over social policy than those in mass public systems?

We begin with the contrast between elite and mass enrollment systems. Elite systems, by limiting the number of graduates while maintaining developed systems of vocational education, remain dominated by workers with specific skills. Following the logic of Iversen and Soskice (2001), these specialists continue to see to unemployment as particularly risky and should continue to support extensive investment in publicly provided transfers that guard against these risks. By contrast, mass systems produce a growing number of graduates who have fewer firm specific skills, less lengthy job tenure, and higher wages (OECD, 2001). In the Iversen and Soskice framework, this movement

should reduce support for expansive social policy. Thus a simple implication is that increased higher education erodes support for the welfare state

However, Iversen and Soskice's framework largely conceptualizes demand for social *insurance* not social spending more generally, neglecting the key role that public services may play in facilitating employment for graduates. Graduates may face fewer risks than those with specific skills from losing a particular job, but the overall conditions for employment could well be of interest. Because college graduates are disproportionately employed in the service sector, are more likely to be female than those with specific skills, and rely on complementary services provided by low skilled workers (e.g. childcare) to facilitate employment (Wren, this volume), graduates may well support public *services* that both directly employ them and enhance their employment opportunities. This outcome though, is likely to depend on whether they are graduates from a mass public or a partially private higher education system. As argued above, the link between mass public higher education systems and the structure of public employment in Scandinavian countries is no mere accident. This complementary architecture may also reinforce the preferences of graduates for continued social spending on *services* (even if support for *transfers* is declining). As we show above, graduates are more likely to be employed in the public sector in mass public systems and consequently they have a direct interest in sustaining the public sector as an employer. However, because a large public sector compresses wages at both the top and the bottom of the income distribution, graduates may also demand public employment for low-skilled workers who provide complementary services such as child and elderly care.

Conversely, in mass partially private systems, graduates will have a different preference profile. Here, graduates are drawn to dynamic private services. As with mass public systems, transferable skills and higher wages make the public provision of transfer payments to guard against unemployment less necessary. However, unlike graduates in the mass public system, these workers also face fewer incentives to demand public services. The public sector is a less important employer in this system, and less wage compression at the top and the bottom of the labor market makes it possible for graduates to purchase complementary services from low-skilled workers in the private sector. As a result, we predict that overall levels of graduate support for public spending on both transfers and services should be relatively low in such countries.

Quality of Governance: Figure Three above suggested that the combination of expanded higher education and wage compression has the effect of driving more graduates into the public sector, increasing the average productivity of both the public and private sectors. This double improvement occurs because restricted private sector employment for graduates means that only the most productive graduates can obtain jobs in the private sector, while a large group of moderately productive individuals enter public sector employment. By contrast, in partially private systems, most graduates enter the private dynamic service sector, leaving only the least productive individuals in public sector jobs. While this basic insight is clearly a simplification of a much more complex career choice reality, it does appear to reflect some of the tradeoffs made by students across higher education systems and folk wisdom about the relative merits of public services in Anglo-American versus Scandinavian countries.

Differences in the quality of governance may reinforce differential graduate support for public services across these two systems. In mass public systems the higher overall skill profile and productivity of the public sector may make public provision more effective, thus more likely to garner the trust and support of graduates and non-graduates. Conversely, in partially private systems, the lower level of productivity in the public sector (which employs fewer and less productive graduates) makes public provision appear less efficient compared to market provision. Thus graduate employment choices *and* support for public services may be mutually constitutive, raising the possibility of self-reinforcing equilibria among the varieties of existing welfare state.

Institutional Stability: Recent work in political economy has argued that because political and economic institutions are complementary, advanced industrial nations will continue to have diverging production profiles, welfare regimes, and skills mixes in a changing global economy (Hall and Soskice, 2001; Thelen, 2004; Iversen, 2005). Yet the focus of much of this work has been on the interplay of vocational training and high-end manufacturing, permitting the continued existence of a robust European manufacturing export sector (a theoretical development foreseen by Streeck, 1991). Neglected so far has been the striking distinctions between the size and funding structure of European higher education systems, and how such differences might themselves support a multitude of 'high skills equilibria', to borrow from Finegold and Soskice's (1988) well known formulation. Our analysis of the interplay between higher education systems and employment patterns in the service sector suggests that even *within* the purview of general skills provision there are a variety of complementary labor market outcomes with

important implications for the ability of OECD nations to adapt to the productivity challenges posed by the structural shift towards service provision.

In the previous section we suggested that the labor market outcomes produced by these combinations of higher education systems and service sector employment may have important repercussions for preferences over welfare provision. Consequently, if political coalitions emerge around cleavages formed by these preferences, these outcomes may be self-sustaining, as policymakers develop welfare policies that fit particular configurations of higher education and service sector employment. This speaks to a broader literature on the importance of path dependency in welfare state structure (Pierson, 1996). Changing between higher education systems may not be a simple task in a world of complementary institutions. For example, if the Scandinavian countries wished to introduce tuition fees they would face the problem that graduates may not be able to find high-enough paying jobs in the labor market to repay those fees. Graduates would prefer to take on dynamic service sector jobs rather than public sector jobs – yet few such jobs would exist. Similarly, a state attempting to revert from a partially private higher education system to one that was fully publicly subsidized would have to charge higher taxes. Such taxes could at that margin crowd out investments citizens would otherwise make in the financial assets that underpin business in the FIRE services. Thus, it may not be possible for states to 'split the difference' and choose freely from a menu of higher education systems and employment structures. The two trilemmas outlined here - Iversen and Wren's (1998) analysis of the service economy and Ansell's (2008) analysis of higher education - are crucially interdependent. Any attempt to reform a HE system will have implications for the labor market and the structure of wage equality, employment and

public spending, and equally different patterns in the labor market have crucial implications for how states structure higher education. Even though higher education systems produce transferable and flexible skills, the institutions themselves might prove more specific.

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Table One: Employment Shares in FIRE and Social Services 1998 (OECD, 2000)

	FIRE services	Social Services
Australia	14.7	22.2
Austria	10.5	21.7
Belgium	11.7	29.8
Canada	16.5	22.3
Denmark	11.4	31.2
Finland	11.3	28
France	11.9	29.2
Germany	10.9	24.8
Greece	7.4	17.7
Ireland	11.5	19.6
Italy	9.3	22
Japan	22.6	. .
Netherlands	14.3	27.6
New Zealand	13.5	22
Norway	10.6	32.8
Portugal	5.5	16.2
Spain	9	18.5
Sweden	12.2	33.4
Switzerland	15.3	24.3
United Kingdom	14.7	25.7
United States	15.8	24.8
Average	12.4	24.7

Table Two: Wage Dispersion in the Top Half of the Income Distribution (p90/p50)

	1985	2001
Australia	1.7	1.9
Belgium	1.7	1.6 (1995)
Canada	1.8	2.0
Denmark	1.5	1.7
Finland	1.7	1.7
France	1.9	2.0
Germany	1.7	1.7
Japan	1.8	1.8
Netherlands	1.6	1.8
New Zealand	1.7	1.8
Norway	-	1.5
Sweden	1.6	1.7
UK	1.7	2.0
USA	1.8	2.3
Mean	1.71	1.82
Standard Deviation	0.10	0.20

Data from OECD, 2008.

Table Three: Changes in Employment under Different Higher Education Systems

	Wage Compression		**No Compression**
	Elite	**Mass Public**	**Partially Private**
Dynamic Services	Little Increase	Little Increase	Large Increase
Nondynamic Services	Little Increase	Large Increase	Moderate Increase
Low Tech Manufacturing	Minor Decrease	Moderate Decrease	Major Decrease
Hi Tech Manufacturing	Little Increase	Large Increase	Little Increase

Table Four: Estimating the Effect of Enrollment on Employment Shares

	(1) Services	(2) FIRE	(3) Social	(4) Education	(5) Retail/Cater	(6) Retail	(7) Mfg.	(8) Hitek Mfg	(9) ICT
Lag DV	0.885	0.871	0.740	0.695	0.750	0.475	0.727	0.952	0.943
	(0.024)***	(0.029)***	(0.038)***	(0.051)***	(0.044)***	(0.054)***	(0.029)***	(0.036)***	(0.036)***
Enrolment	0.979	1.115	0.788	0.372	0.119	-0.337	-3.194	0.008	-0.005
	(0.624)	(0.374)***	(0.520)	(0.212)*	(0.500)	(0.399)	(0.592)***	(0.116)	(0.149)
D.Enrol	2.675	0.341	1.302	0.414	1.332	0.507	-2.180	-0.308	-0.064
	(1.135)**	(0.638)	(1.030)	(0.410)	(0.926)	(0.598)	(0.839)***	(0.242)	(0.367)
Enrol*Scan	-1.732	-1.042	0.543	0.531	-1.607	-2.416	2.313	0.444	0.355
	(0.928)*	(0.538)*	(0.897)	(0.329)*	(0.909)*	(0.730)***	(0.825)***	(0.168)***	(0.175)**
D.Enrol*Scan	1.140	1.695	1.872	-1.285	-2.689	-0.490	1.474	0.063	-0.004
	(4.631)	(2.624)	(4.299)	(1.776)	(3.829)	(2.530)	(3.535)	(0.880)	(0.926)
GDP p.c.	0.079	0.022	0.090	-0.002	0.052	0.052	-0.022	-0.007	-0.004
	(0.029)***	(0.014)	(0.027)***	(0.009)	(0.022)**	(0.019)***	(0.021)	(0.005)	(0.005)
D.GDP p.c.	-0.143	0.103	-0.144	-0.045	0.046	0.033	0.208	0.001	0.024
	(0.081)*	(0.045)**	(0.077)*	(0.032)	(0.067)	(0.047)	(0.061)***	(0.017)	(0.017)
Gov Exp.	0.167	-0.022	0.266	0.072	0.031	0.058	-0.044	-0.003	0.001
	(0.036)***	(0.019)	(0.038)***	(0.015)***	(0.029)	(0.025)**	(0.029)	(0.008)	(0.008)
D.Gov Exp.	0.238	0.037	0.192	0.045	0.047	0.054	-0.046	-0.018	-0.006
	(0.057)***	(0.032)	(0.053)***	(0.023)*	(0.047)	(0.033)	(0.043)	(0.014)	(0.013)
Openness	0.107	-0.308	0.235	0.118	0.744	1.305	1.798	0.187	0.302
	(0.300)	(0.161)*	(0.272)	(0.119)	(0.235)***	(0.174)***	(0.229)***	(0.102)*	(0.094)***
D.Openness	-0.103	-0.084	-0.027	-0.120	0.272	0.516	1.042	0.112	0.073
	(0.496)	(0.275)	(0.456)	(0.205)	(0.402)	(0.283)*	(0.360)***	(0.124)	(0.115)
Constant	2.300	2.400	-0.939	-0.055	0.355	1.013	0.247	-0.449	-0.848
	(1.167)**	(0.618)***	(0.974)	(0.458)	(0.746)	(0.381)***	(0.561)	(0.485)	(0.435)*
Observations	283	283	283	216	283	243	283	195	183
Countries	23	23	23	22	23	23	23	15	14

Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions include country fixed effects and an AR1 error term. 23 countries analyzed from 1980 to 1997.

Table Five: Estimating the Effect of Enrollment on Employment Ratios

	(1) Serv/Mfg	(2) FIRE/Mfg.	(3) FIRE/HiMfg	(4) Soc/Mfg.	(5) Soc/Serv	(6) FIRE/Serv	(7) FIRE/Ed.	(8) FIRE/Pub	(9) FIRE/Health
Lag DV	0.847	0.891	0.596	0.843	0.843	0.877	0.214	0.749	0.784
	(0.027)***	(0.027)***	(0.058)***	(0.029)***	(0.029)***	(0.032)***	(0.067)***	(0.055)***	(0.045)***
Enrolment	0.471	0.113	2.709	0.181	-0.018	0.035	0.250	0.539	0.089
	(0.117)***	(0.031)***	(0.984)***	(0.053)***	(0.009)**	(0.018)**	(0.112)**	(0.127)***	(0.092)
D.Enrol	0.302	0.035	6.766	0.095	-0.011	0.001	0.054	0.111	0.137
	(0.182)*	(0.045)	(1.345)***	(0.096)	(0.016)	(0.034)	(0.147)	(0.213)	(0.201)
Enrol*Scan	-0.542	-0.119	-5.766	-0.180	0.017	-0.043	-0.874	-0.419	-0.204
	(0.157)***	(0.041)***	(1.260)***	(0.078)**	(0.014)	(0.028)	(0.199)***	(0.198)**	(0.142)
D.Enrol*Scan	0.080	-0.009	6.434	0.373	-0.009	0.055	0.384	0.260	0.731
	(0.763)	(0.188)	(5.173)	(0.399)	(0.067)	(0.138)	(0.648)	(0.946)	(0.855)
GDP p.c.	0.009	0.002	0.085	0.004	0.001	0.000	0.040	0.006	-0.002
	(0.004)**	(0.001)	(0.038)**	(0.002)*	(0.000)**	(0.001)	(0.006)***	(0.006)	(0.004)
D.GDP p.c.	-0.051	-0.004	0.110	-0.032	-0.001	0.008	0.032	0.041	0.065
	(0.013)***	(0.003)	(0.102)	(0.007)***	(0.001)	(0.002)***	(0.012)***	(0.017)**	(0.014)***
Gov Exp.	0.018	-0.000	0.055	0.013	0.003	-0.002	-0.012	-0.028	0.006
	(0.005)***	(0.001)	(0.058)	(0.003)***	(0.001)***	(0.001)**	(0.007)*	(0.008)***	(0.006)
D.Gov Exp.	0.032	0.004	0.116	0.018	0.002	0.000	0.005	0.003	0.024
	(0.009)***	(0.002)*	(0.080)	(0.005)***	(0.001)**	(0.002)	(0.008)	(0.012)	(0.011)**
Openness	-0.092	-0.024	0.015	-0.050	0.016	-0.012	-0.003	0.017	0.008
	(0.045)**	(0.011)**	(0.681)	(0.026)*	(0.005)***	(0.009)	(0.040)	(0.055)	(0.082)
D.Openness	-0.051	-0.010	0.700	-0.028	0.006	0.005	0.116	0.102	-0.099
	(0.080)	(0.019)	(0.718)	(0.042)	(0.007)	(0.015)	(0.072)	(0.107)	(0.104)
Constant	0.293	0.118	-0.426	0.069	-0.010	0.124	0.734	0.623	0.220
	(0.157)*	(0.035)***	(2.255)	(0.106)	(0.014)	(0.035)***	(0.080)***	(0.198)***	(0.408)
Observations	283	283	195	283	283	283	216	216	216
Countries	23	23	15	23	23	23	22	22	22

Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions include country fixed effects and an AR1 error term. 23 countries analyzed from 1980 to 1997.

Figure One: Enrollment, Private Spending, and Public Cost in 2002 (Ansell, 2008)

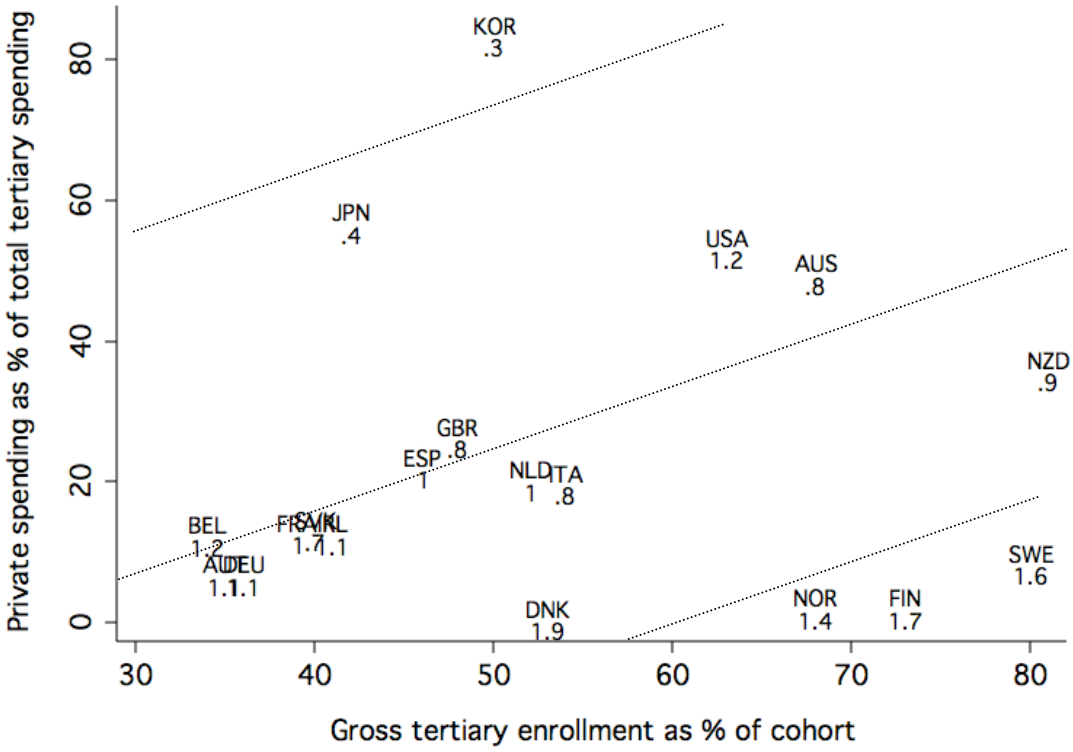

Figure Two: Wage Compression and High and Low Productivity Workers

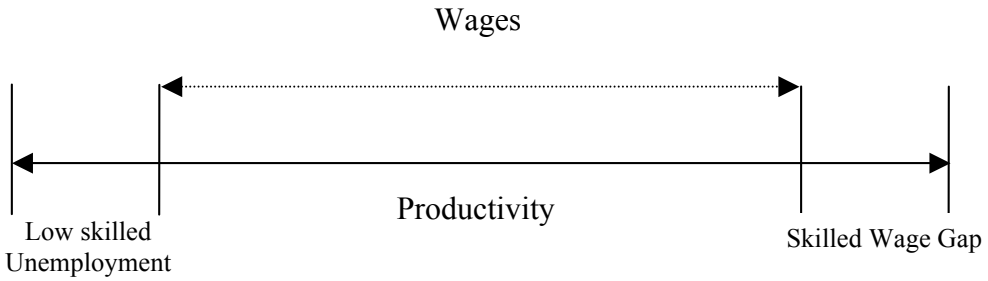

Figure Three: Wage Compression and Employment Choice in Services

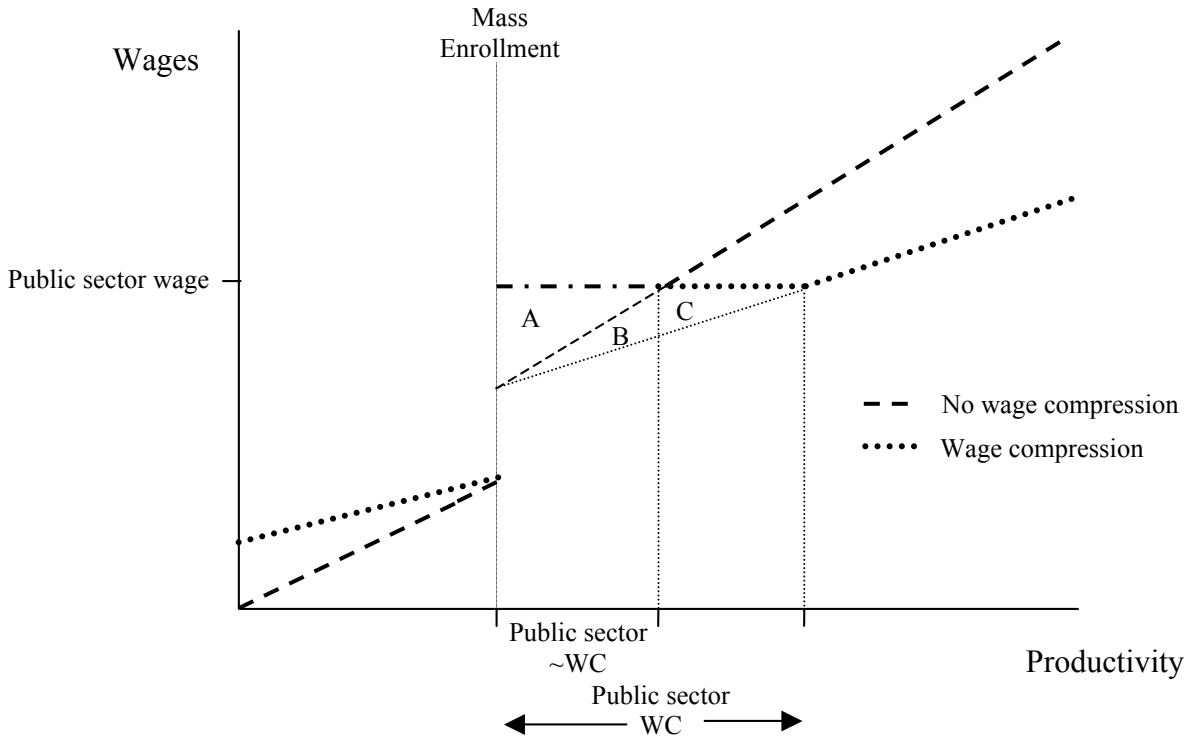

Figure Four: Enrollment and the FIRE/Services Ratio

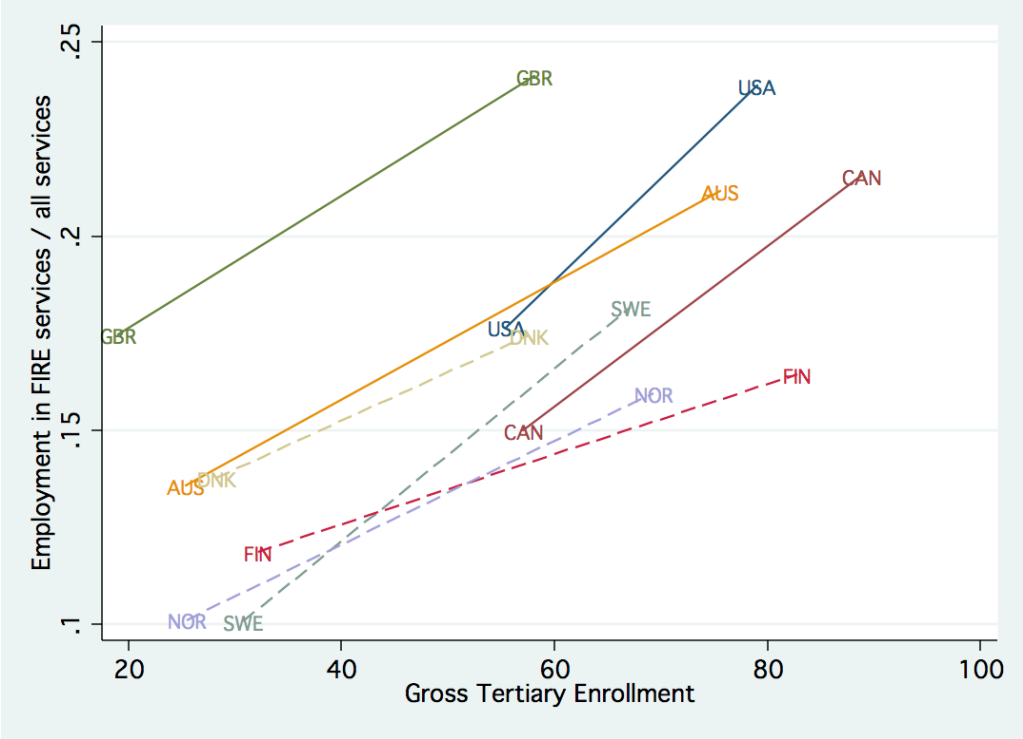

Figure Five: Enrolment and the Service / Manufacturing Ratio