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Service Employment and Unemployment in the Great Recession: Trends in OECD Countries

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Service Employment and Unemployment in the Great Recession: Trends in OECD Countries

DRAFT – TO BE EXTENDED

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Abstract Unemployment in Europe has reached 10% as this Abstract was prepared, and it was over 10% in the United States at the same time. How has the service economy been related to the current global recession? That is the focus of this paper. Much has been written about the impact of the structural shift to service industries on cyclical fluctuations in advanced economies. In general it has been argued that because the demand for services is relatively steady, a more service-oriented economy should have less cyclicality in employment through business cycles. However, this argument has been made primarily for services sold to consumers, as opposed to services sold on intermediate account (producer services). One of the goals of the current paper is to extend conceptualization of cyclical services demand to producer services, and to evaluate differences in cyclicality and producer and consumer services. The Great Recession that may be benchmarked against December 2007 was strongly associated with troubles emanating from components of the service economy, especially with the finance sector and the financing of housing investment. This paper explores arguments regarding the presumed steadier trajectories for employment in service dominated economies with evidence regarding actual sectoral employment change through the Great Recession. The paper uses data for many OECD countries and states in the United States to evaluate these structural relationships.

I. Introduction and Overview

The current global recession appears to be strongly linked to events in the United States service economy—in particular the real estate lending sector, that is in turn strongly tied to a variety of financial institutions. Whether these events were the causal agent can be debated, but it is clear that globalization of the financial sector helped spread problems in U.S. real estate markets to the financial institutions in many other countries. The up-front problems in the financing of the U.S. housing market have led to downstream impacts that are much broader sectorally and globally. Thus, is this recession different in its root causes that previous recessions, and are the downstream effects different, or do they mirror previous recessions? This paper explores these issues, with data for U.S. states and OECD countries.

In the United States the residential real estate sector was historically dominated by mortgage instruments for single structures, that were held by the lender for these mortgages, typically a local bank. However, in the last fifty years mortgage debt has gradually become securitized like other assets, and packaged in instruments that were traded nationally and internationally. As is painfully clear now, some of these instruments were not protected by financial regulations primarily designed during or after the Great Depression of the 1930's. Banking and financial entities engaged in developing creative financial instruments, which have turned out to be unsustainable. Traditional purchasers of such debt—such as insurance companies using resources from their insured—have found themselves without income needed to repay their creditors, leading to dramatic financial collapses such as AIG. Banks have been caught without sufficient resources to repay creditors, and have collapsed or have been bought up by surviving institutions (such as WAMU's absorption by Chase). Much hand-wringing is currently taking place about the nature of new institutions to provide oversight so that these problems do not recur. This real-estate "bubble" was fueled by public policies to promote home ownership, rapid growth rates in particular regions where prices escalated speculatively to levels unsustainable when compared to household income, and by an investment community eager to expand its scope.

The initial impact in the United States was a sharp realization that entities holding this housing debt were in a financially untenable position, leading the federal government to intervene with the "TARP" funds, aimed at propping up these financial institutions until they could regain "normal" operating positions. This has meant disruption in housing markets that is ongoing, as people lose their homes when they are unable to restructure their debt to affordable levels, or when they simply default on ownership. It is unclear whether current interventions will be sufficient to stem these housing market effects, and whether the financial entities will recover to reasonable positions of regulated solvency.

The secondary consequences of these disruptions in financial markets have been sharp, ongoing, and have spread far beyond the United States. This paper explores these recent events, using December 2007 as the benchmark date for the start of the current

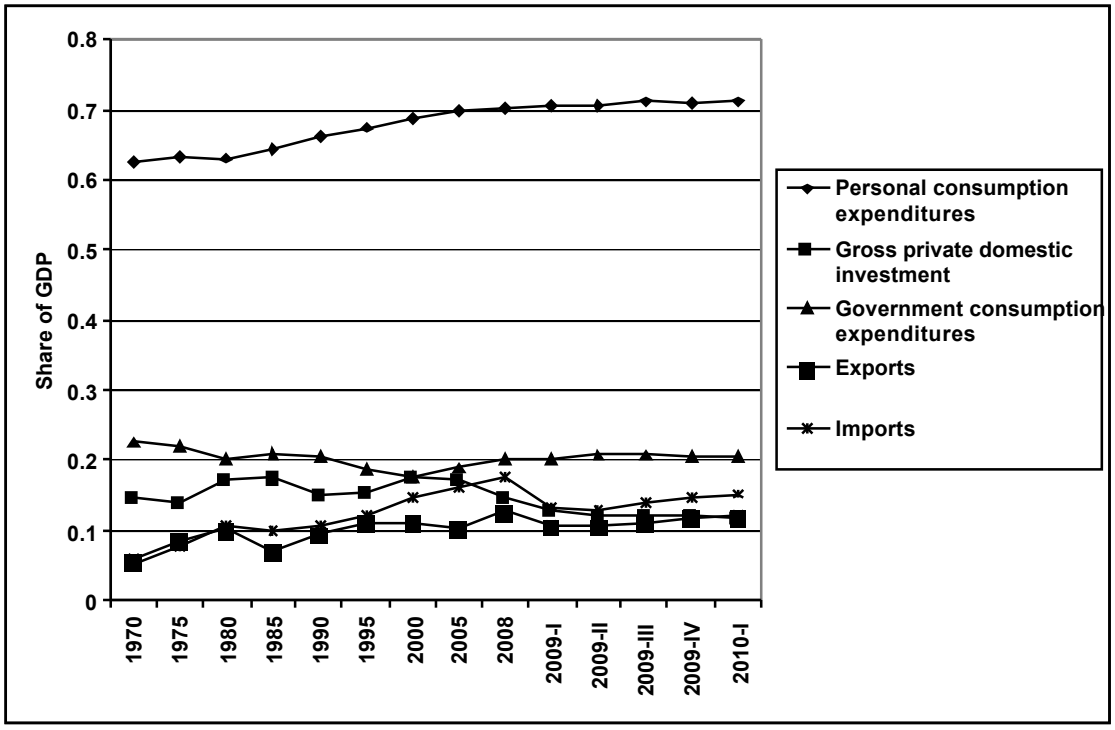
recession. It relies on recent data from the U.S. government, as well as OECD sources, to focus on the structural impacts of the downturn. The next section provides some background literature on the role of services in periods of recession. This is followed by analyses of recent historical trends in the OECD and U.S. economies. This analysis leads to the articulation of a model for this recession, and some comparison of its contours up to the moment in comparison to other recent downturns. The paper concludes with some remarks regarding needed research.

II. Background Literature

The literature on the relationship between business cycles and the shift to a service dominated economy is not large. Several analyses deserve mentioning, including the work of Moore, Rubalcaba-Bermejo, and Cuadrado-Roura.

It is well known that business cycles have historically been associated with strong swings in investment levels, that in turn have led to strong fluctuations in the demand for construction and the goods that enter into the investment process. One of the consequences of a shift to the service economy has been a dramatic change in the composition of business investment. The share of investment associated with structures and equipment has fallen. Figure 1 shows for the U.S. economy the changing shares of Gross Domestic Product from 1950 to the 1st quarter of 2010. The long term trend has been a reduction in the relative importance of government, a gradual drift upward in the share of consumption, rising shares of exports and imports, and a rise in the share of investment. However, it is evident in Figure 1 that the current recession has decreased the contribution of investment, and has increased the share associated with government. Exports and imports have also decreased as a share of gross domestic product.

Figure 1 Share of Gross Domestic Product United States

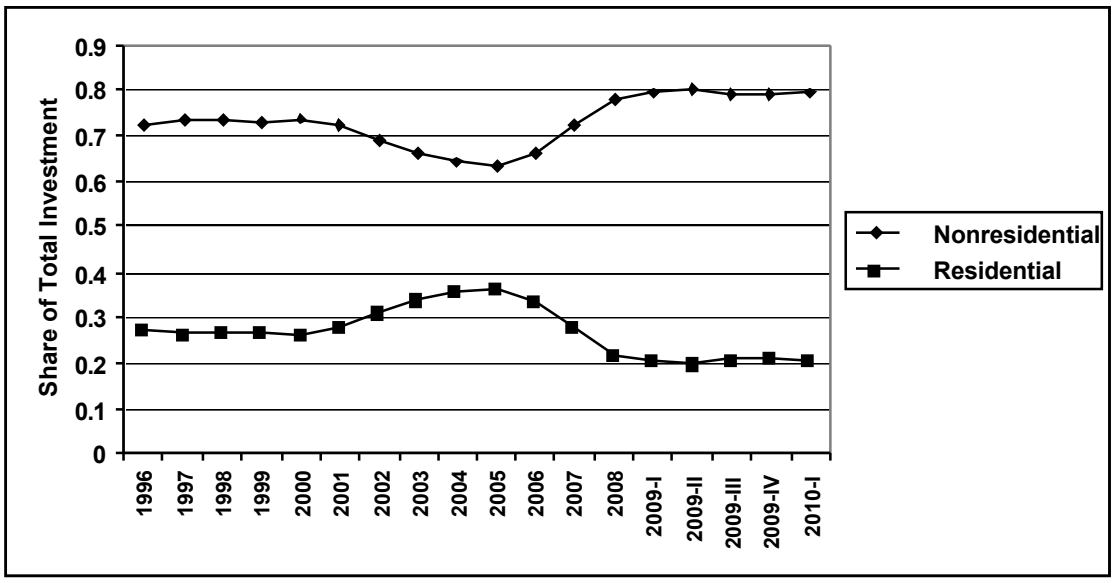


Source: Calculated by Author from U.S. Bureau of Economic Analysis

The collapse of the residential investment sector in the current recession is clearly evident in Figure 2. This figure shows that the share of residential investment hovered

around 30% in the United States for the 1993-2006 time period. However, this share has plummeted to 20% in the current recession.

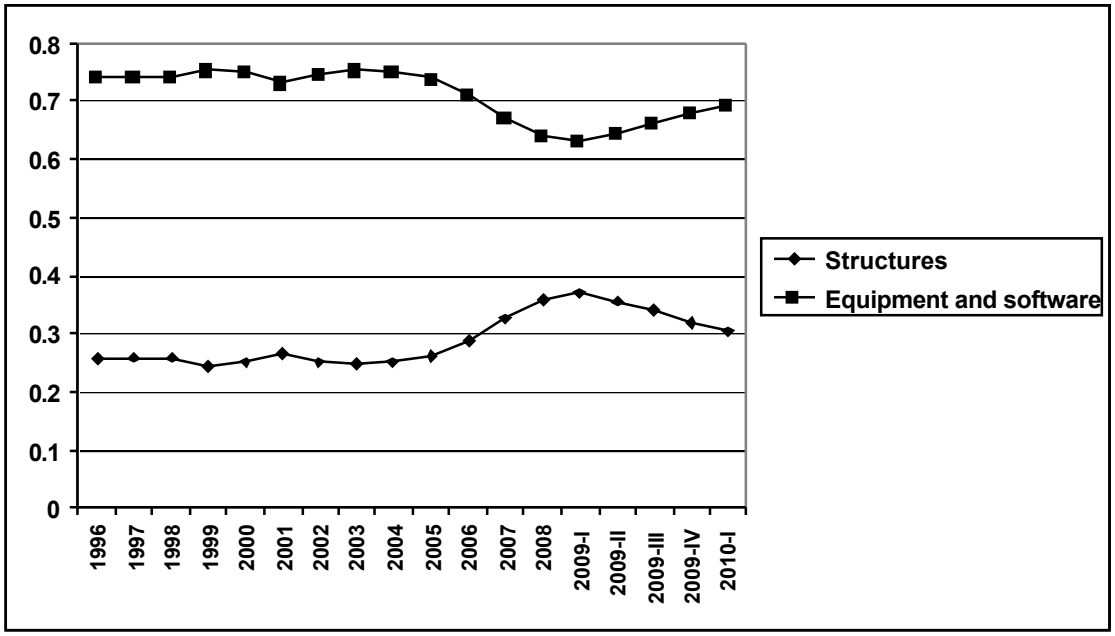
Figure 2 Residential and Nonresidential Shares of Private Investment United States



Source: Calculated by Author from U.S. Bureau of Economic Analysis

The current downtown has also impacted the mix of nonresidential investment. Figure 3 shows the long run trend towards a larger share of this investment being associated with software and equipment, and a smaller share associated with structures. In large measure the changing relative ratio has been related to the growth of the service economy, where compared to manufacturing, the share of investment in structures is lower than in equipment and software. The sharp break in 2007, related to the current recession, puts the ratio of equipment and software back to the level of the early 1990's.

Figure 3 Share of Nonresidential Investment in Structures vs. Equipment and Software



Source: Calculated by Author from U.S. Bureau of Economic Analysis

With the overall shift in production towards a larger service economy, it has been argued that business cycle tendencies will be dampened due to the relatively stable demand for services. Cuadrado-Roura makes this argument:

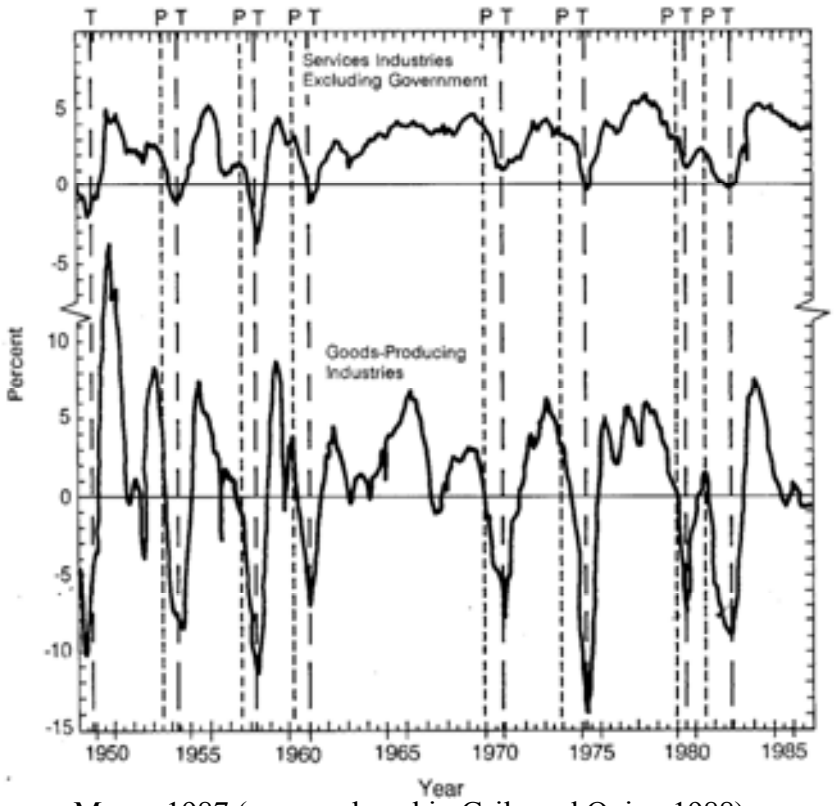
> ….the consumption of non-durable goods and a good number of services shows slower relative fluctuations. One of the main explanations is that consumption of durable goods can be postponed—for obvious reasons, while stocking services presents evident difficulties and, as a result, makes their consumption more stable. (Cuadrado-Roura 2001, p.105).

Cuadrado-Roura notes that there has been a systematic change in the nature of business cycles in modern times, with longer cycles and longer periods of expansion, and shorter periods of contraction (Cuadrado-Roura 2001 p. 105). He notes that part of this due to the growth of the demand for private services, but also is related to the expansion of the demand for public services that are also less subject to demand fluctuations. In a case study of the Spanish economy, he shows how these trends have played out in this style over the 1940 to 1990 time period.

An earlier analysis of these relationships was reported by Moore. Using data for the U.S. economy over the 1949-1986 time period, he shows that the levels of change in employment in goods producing industries was much greater than in service producing industries. Figure 4 is taken from Moore's paper, and this graph shows not only less fluctuation in employment in the services compared to goods-producing industries, but also after the recession of the early 1960's no job losses on the downturn in the service sector. Moore projects likely changes in employment in two hypothetical recessions, occurring in 1990 and 1995. In these projections, he shows private services and

government expanding, while the goods producing sectors are predicted to be the source of all job losses.

Figure 4 Growth Rate in Employment in the Service Industries and Goods-Producing Industries



Source: Moore 1987 (as reproduced in Guile and Quinn 1988).

Moore discusses the demand for services in relation to these cyclical patterns. He writes:

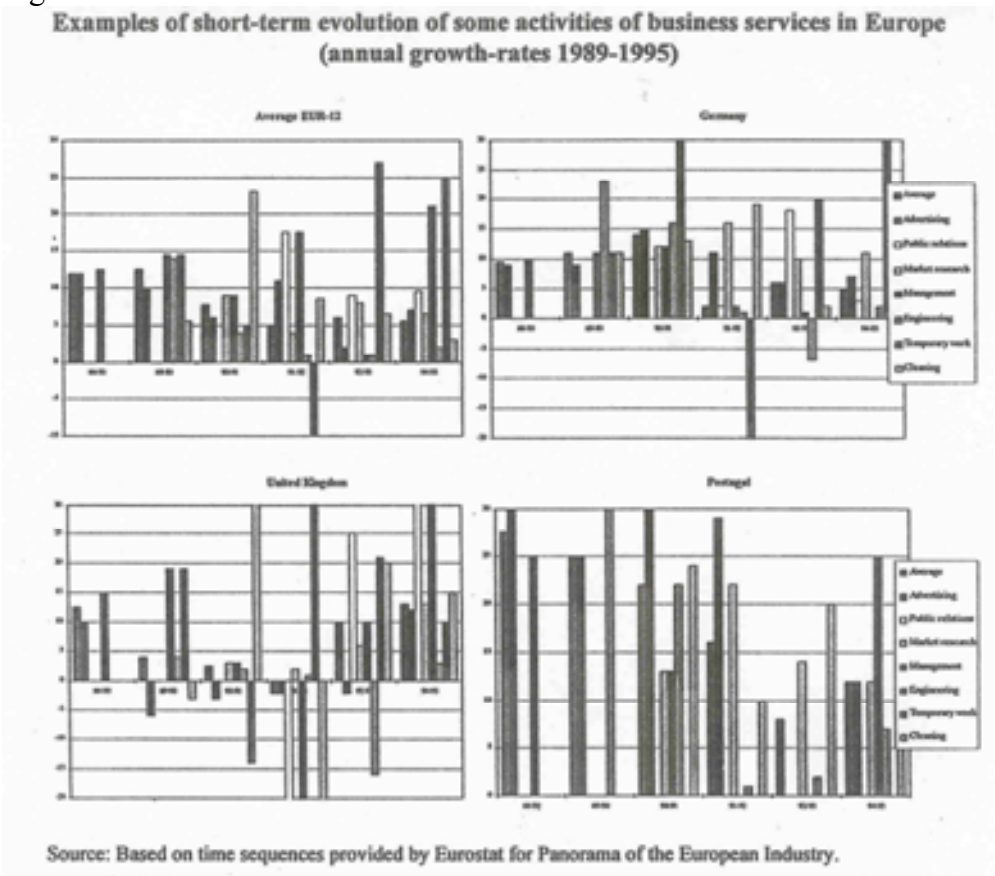
> The purchasing power created by additional jobs in services must help to maintain demand for consumer goods and hence delay downturns and hasten upturns in the goods-producing sector itself. This development in turn would contribute to the prolongation of business cycle expansions and shortening of recessions. Although we have not tried to measure this directly, the near equality shown…between the lengths of business cycle phases and those in total non farm employment carries with it the implication that the rapid growth in service industries employment has had a favorable effect on the relative length of the prosperous and depressed phases of the business cycle (Moore 1987).

Moore and Cuadrado-Roura do not discuss the changing nature of the service economy, and particularly the emergence of the large producer services sector, whose demand is not primarily with consumers, but rather across the spectrum of industries.

Their arguments are phrased largely in the context of consumer oriented services. Analyses of the markets of producer services find that their clients are spread across the economy, and it would seem likely that the demand for these services would be impacted by client sectors hit hard by business cycles. This topic will be revisited later in this paper.

Rubalcaba-Bermejo has also examined the role of services in business cycles in Europe (Rubalcaba-Bermejo 1999). His analysis concentrated on the role of business services, with statistical analyses focused on the 1989-1995 time period. Figure 5 shows results of his analyses for the EUR-12, Germany, the United Kingdom, and Portugal. This graph clearly shows cyclicality in the growth rates for business services, with a significant drop associated with the 1991-1992 recession. For the EUR-12 temporary work shows the strongest degree of cyclicality, and it is clear that there are major differences in these patterns across countries in Europe.

Figure 5



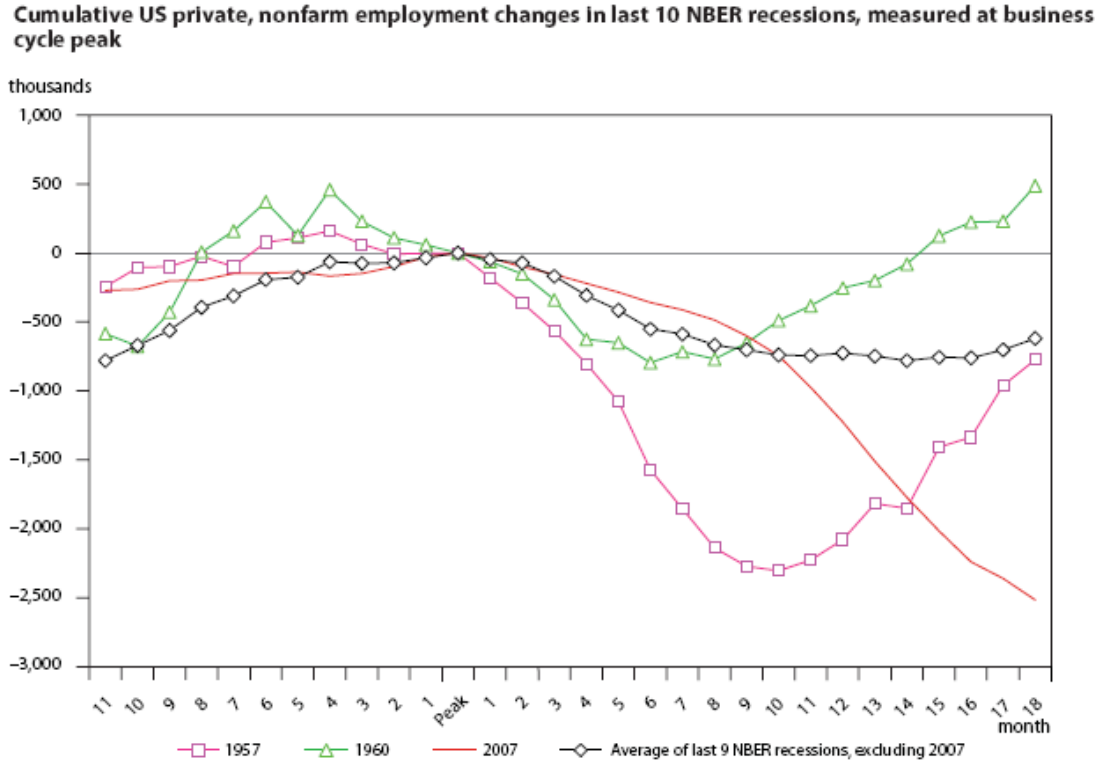
Source: (Rubalcaba-Bermejo 1999, Graph 3.11, p. 175).

Rubalcaba-Bermejo concludes as follows:

> Our results emphasize, still more, if that is possible, the heterogeneity of situations according to country and activity. Additionally, they verify that business cycles affect business services without qualification. Nevertheless, it also seems evident that a structural growth component exists that tends to take precedence over the pro-cyclical one. For this reason, business services' slump during recessions is by any reckoning less than that which takes place in the vast majority of other economic sectors. The strong structural growth of business services explains the causes of this peculiarity. This makes business services a potential instrument for policies that aim to guarantee an equilibrated and stable economic path (Rubalcaba-Bermejo 1999, p. 176).

A very recent analysis by Kirkegaard provides useful insights into the current economic downturn in the United States, compared to other business cycles since 1949. Figure 6 shows job losses in the current downtum compared to the last 10 recessions, and it is very clear that the current downturn is much steeper than the average recession in the United States.

Figure 6

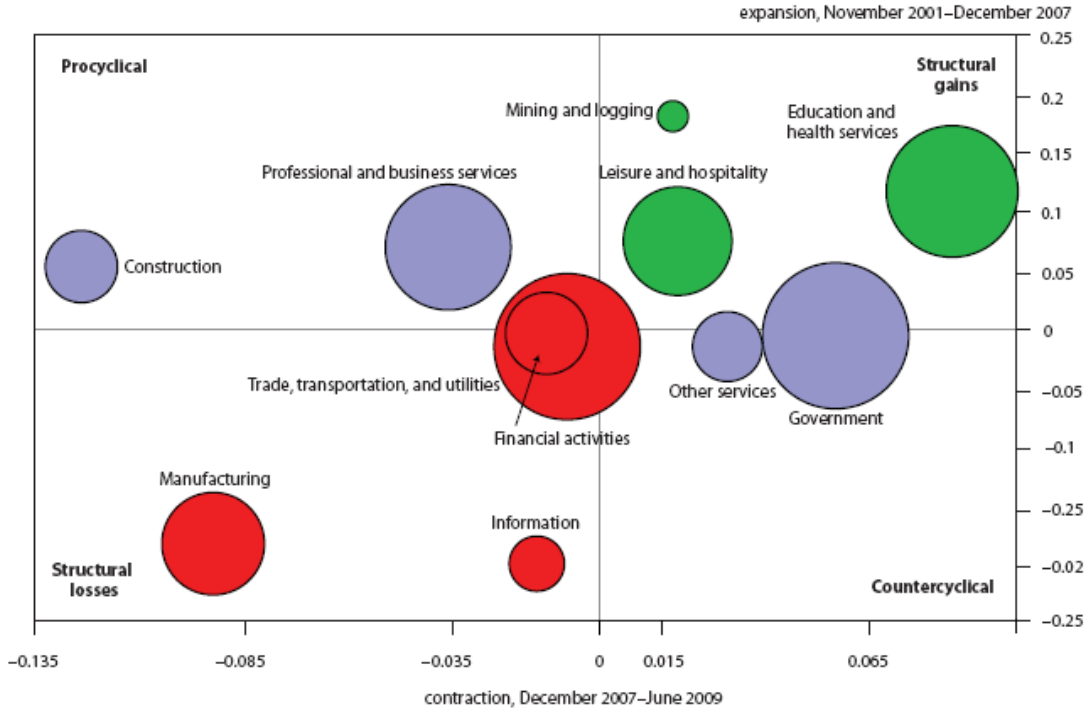


Source: (Kirkegaard 2009)

Kirkegaard also presents detailed evidence on the composition of employment in the current downturn, as well as over the course of the last expansion. Two figures from his work are included here, illustrating the importance of services in both these expansions and in the current contraction. Figure 7 presents estimates of employment change, colored according to their position in patterns of job change. The size of the

bubbles in Figure 7 is proportional to total employment in these sectors. Green sectors are experiencing net structural employment gains, while red bubbles are experiencing structural employment declines. Blue bubbles are either countercyclical or procyclical. Kirkegaard provides detailed information on components of change in these broad sectoral groups; space does not allow inclusion of this detail in this paper.

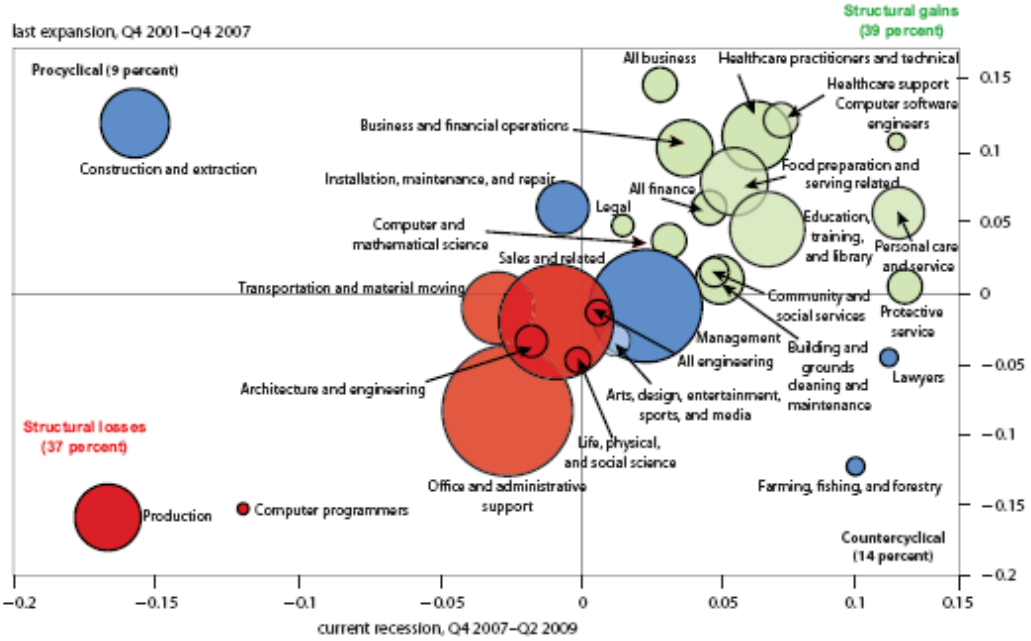
Figure 7 Structural and cyclical trends during the last business cycle, weighted by industry



Source: (Kirkegaard 2009, Figure 13).

Kirkegaard also presents data for the same time period by occupation, as reproduced in Figure 8. This figure highlights in green the occupations with structural gains (accounting for 39% of total change), those with structural losses (accounting for 37% of total change), and those that are procylical (9% of change), and those that are countercyclical (14% of total). Clearly, many of the occupations with structural gains are associated with advanced services.

Figure 8 Structural and cyclical employment trends during the last business cycle by occupation relative to total employment



Source: (Kirkegaard 2009, Figure 21).

III. Analysis

A data base was developed from U.S. and OECD data to explore changes in employment in the current recession. This analysis was benchmarked against either December 2007, the fourth quarter of 2007, or the year 2007. In the U.S. economy, December 2007 marks the peak level of employment, and has nominally been regarded as the date of the beginning of the current recession. However, the seeds of the downturn were evident earlier, with the emergence of problems in the financial sector related largely to real estate financing as discussed earlier. The goal of the analysis was to explore the role of services in the current economic downturn. The outward presumption was that this downturn was different than other recent downturns, as it was essentially precipitated by problems in a service sector. However, the mechanisms by which employment was impacted could be such that while certain financial services were associated with the needs of governments to intervene, the actual impacts followed other channels, linked to consumption, investment, and intermediate demand for services. If that were the case, then this recession should have structural similarities to other recent recessions.

Two levels of analysis are presented. First, I will examine recent data for OECD countries, and then I will turn to an analysis of change in the United States as a whole, and in states of the United States.

1. OECD Countries

The OECD provides current data on employment and unemployment conditions in many member countries. These data show the level of employment in 2007 and in the third and fourth quarters of 2009, unemployment for the same time period, the 2007 unemployment rate, the change in the unemployment rate from 2007 to the third or fourth quarter of 2009, the percent of employment that was considered long-term in 2008, and the growth rate of personal consumption from the first quarter of 2008 to the first quarter of 2009. Table 1 summarizes the employment and unemployment situation in OECD countries from 2007 to the latest reporting time period (third and fourth quarter 2009). Almost all countries reported a rise in the level of unemployment, with half of these experiencing a rise in overall employment, and half recording a drop in total employment levels. In most of these cases, the absolute gain in employment was small. In two cases the level of unemployment fell, while total employment rose (Germany and Poland). No country had declines in employment and unemployment.

Table 1 Patterns of Employment and Unemployment Change OECD Countries 2007 to Q3/Q4 2009

	Unemployment Up	Unemployment Down
Employment Up	14	2
Employment Down	14	0

Major differences can be seen in the importance of long term unemployment rates across the OECD countries, as reported in Table 4. This is defined as persons seeking work for at least six months. The United States and the Nordic countries show relatively low long term unemployment rates compared to many European countries. Long term unemployment rates of one-third to one-half of current unemployment are common across much of continental Europe. In analyses that are reported below, an attempt was made to estimate recent changes in levels of unemployment, by removing an estimate of long-term unemployment from these data. This adjustment is imperfect, because of other dynamics involved in the labor force.

Current data were not available for OECD countries for detailed industry employment categories. Data were reported for agriculture, manufacturing and construction, and services. These data were used for the period from 2007 through the 3rd and 4th quarters of 2009, to identify the share of employment associated with each of these broad industry aggregates. Per capita gross national income was not significantly correlated with measures of unemployment. However, as can be seen in Table 4, there is a statistically significant inverse correlation between the level of unemployment in 2007 and the share of employment in services. Expressed alternatively, countries with high levels of employment in services had relatively low levels of unemployment. However, there is no statistically significant relationship between the change in unemployment rates and the share of services employment. However, there is a direct and statistically significant correlation between the change in unemployment levels and the change in the percentage of services employment. This result is undoubtedly related to the declines in manufacturing and construction employment—which raised the share of services employment—and the overall rise in unemployment levels across almost all OECD countries.

Table 3 Employment Trends in OECD Countries

	2007 Employment	q4 2009 Employment	2007 Unemployment	Q4 2009 Unemployment	2007 Unemployment Rate	Change unemployment Rate	2007 % Services	Change % services	Long Term Unemployment % 2008
Australia	10538870	10777400	482126.7	610835.6	4.4%	1.0%	75.3%	0.2%	
Austria	4027800	4089875	185550	200300	4.4%	0.3%	66.7%	3.4%	24.3
Belgium	4380275	4445875	353000	390100	7.5%	0.6%	73.7%	0.9%	47.6
Canada	16866420	17125850	1079433	1430100	6.0%	1.7%	76.3%	1.6%	
Chile	6448858	6641428	495527.5	632790	7.1%	1.6%			
Czech Republic	4907749	4986393	276333.6	384999	5.3%	1.8%	56.1%	2.8%	49.2
Denmark	2778750	2827250	114500	196000	4.0%	2.5%	74.2%	3.2%	13.6
Finland	2482467	2522365	183275	215170	6.9%	1.0%	69.7%	2.1%	18.4
Germany	38209500	38879700	3601950	3061300	8.6%	-1.3%	67.9%	1.9%	52.6
Greece	4509825	4559375	406925	514400	8.3%	1.9%			47.5
Hungary	3890000	3845000	312000	442000	7.4%	2.9%	62.4%	1.7%	46.5
Iceland	177275	178575	4150	12000	2.3%	4.0%			10.0
Ireland	2095400	2108500	101100	264000	4.6%	6.5%	67.6%	7.6%	27.0
Italy	22969910	23159720	1460750	2144650	6.0%	2.5%	66.6%	1.1%	45.7
Japan	64120000	63850830	2568333	3306667	3.9%	1.1%	68.4%	1.7%	32.0
Korea	23432750	23577330	782975	817333.3	3.2%	0.1%	66.9%	2.1%	
Luxembourg	200700	208500	8200	12100	3.9%	1.6%			32.4
Mexico	42552420	43527160	1495157	2498035	3.4%	2.0%			
Netherlands	7264250	7412834	342916.7	413333.3	4.5%	0.8%			34.8
New Zealand	2174475	2188175	82775	158900	3.7%	3.1%	70.8%	2.3%	
Norway	2427250	2507250	63000	75000	2.5%	0.4%	75.9%	1.4%	13.2
Poland	15240250	15799750	1618750	1471000	9.6%	-1.1%	54.5%	2.7%	33.5
Portugal	5134675	5166725	448575	563300	8.0%	1.8%	57.6%	3.0%	47.4
Slovak Republic	2357275	2433750	291850	374600	11.0%	2.3%	56.4%	2.7%	69.6
Spain	20356000	20257620	1833900	4326500	8.3%	9.3%	66.2%	5.6%	17.9
Sweden	4446417	4602800	285008.3	400466.7	6.0%	2.0%	76.1%	1.7%	12.6
Switzerland	4412992	4500293	158234.7	212936.5	3.5%	1.1%	72.4%	1.4%	32.5

Turkey	20750000	21193250	2368250	3270000	10.2%	3.1%	49.8%	-0.3%	
United Kingdom	29230330	29446420	1652667	2412000	5.4%	2.2%	76.6%		24.1
United States	146046700	145362500	7077667	14564670	4.6%	4.5%	78.8%	2.6%	10.0
Total	514429583	518182493	30134879.5	45375486.4	5.5%	2.5%			

Table 4 Selected Correlations for OECD Countries

Correlations

		UNEMP07	CHGUNEMP	PCTSERV	CHGPCTSE
UNEMP07	Pearson Correlation	1	.014	-.655**	-.045
	Sig. (2-tailed)	.	.943	.001	.838
	N	30	30	24	23
CHGUNEMP	Pearson Correlation	.014	1	.007	.604**
	Sig. (2-tailed)	.943	.	.975	.002
	N	30	30	24	23
PCTSERV	Pearson Correlation	-.655**	.007	1	-.055
	Sig. (2-tailed)	.001	.975	.	.804
	N	24	24	24	23
CHGPCTSE	Pearson Correlation	-.045	.604**	-.055	1
	Sig. (2-tailed)	.838	.002	.804	.
	N	23	23	23	23

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 9 Share of employment in services and unemployment rates in 2007

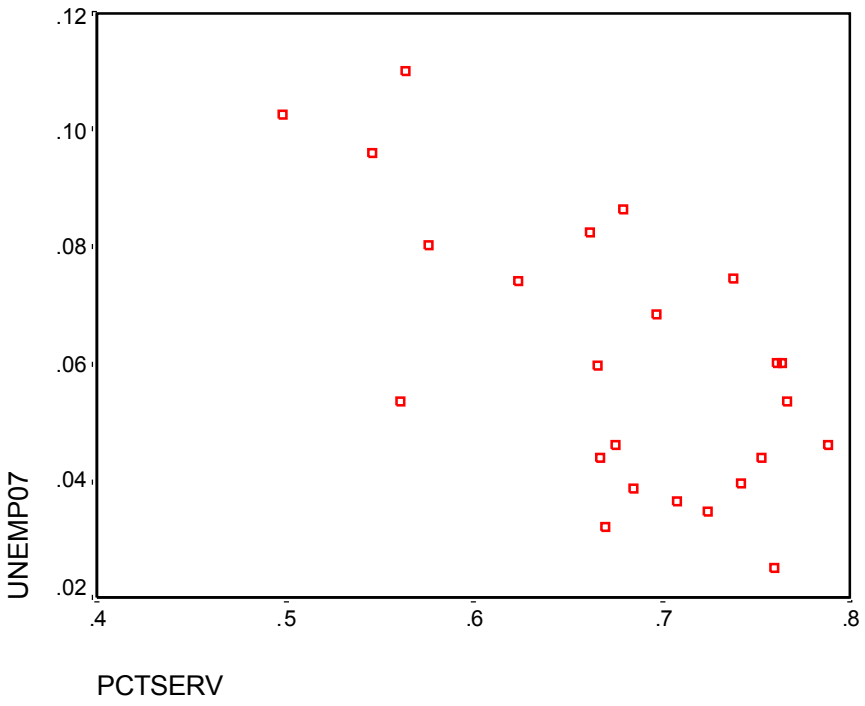
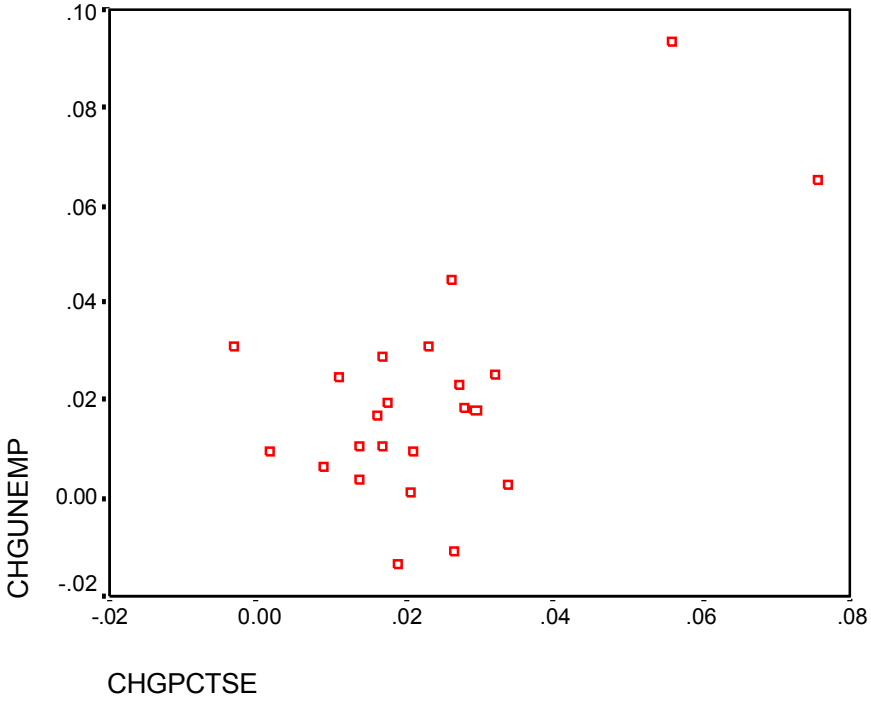


Figure 10 Scattergram of change in percent services employment and change in unemployment rate.



Section Summary

OECD countries have experienced significant rises in unemployment levels, and reductions in employment levels since the 2007. Data were not available for detailed service industries to explore the role of particular lines of services to the current downturn. However, the data are compelling regarding the structure of job losses in these countries—it has been concentrated in manufacturing—with job losses in services being quite small for this group of countries. These data also suggest that the drop in manufacturing is related to a drop in consumption spending. Very recent data on investment were not found, and they too could be correlated with the decline in manufacturing. High levels of structural unemployment in many European OECD countries appear to be strongly related to recent increases in unemployment. These high levels of structural unemployment may be pose difficulties for turning around levels of personal consumption expenditures, which appear to be related to the strong downturns in manufacturing.

2. U.S. Trends

The United States has had a significant increase in unemployment since December 2007. The national rate of unemployment has risen from 5% to 9.9% in April 2010. Literature on business cycles for the United States discussed earlier in this paper has argued that services have not been major contributors to business cycle job losses. Table 6 below reports job changes through 4 recent business cycles in the U.S. These data indicate no job losses in services in the brief recession in 2001-2003, and rapid growth rates in services employment gains in the two expansions reported in this table. However, in the current downturn BLS data show a larger decline for services than reported in the OECD statistics (in fact about double the OECD estimate). Over half of the job losses in the United States in the current recession have come in services, but this is only a 3.7% decline in services employment, compared to a 19% decline in employment in goods production.

Table 6 Goods and Services Employment change in recent U.S. business cycles (thousands of jobs)

	Total Change	Change Goods	Change Services	% Change Goods	% Change Services
Jan 1999 to Feb 2001	5,050	69	4,981	0.3%	4.8%
Feb 2001 to August 2003	-2,708	-2,767	59	-11.3%	0.1%
August 2003 to Dec. 2007	8,330	335	7,995	1.5%	7.4%
Dec 2007 to February 2010	-8,564	-4,214	-4,350	-19.1%	-3.7%

Source: Calculated by author from U.S. Bureau of Labor Statistics data.

Table 7 reports detailed changes in industry employment in the United States from December 2007 through February 2010. The data source here is slightly different

than in Table 6 above. Table 7 shows much stronger percentage losses of employment in goods producing sectors than in the services. And, like Table 6 above, about half of the job losses in the United States since December 2007 have been in services. Sectors such as wholesaling and transportation, related to the channel of distribution for goods, show relatively large percentage employment reductions. The information and professional and business services sectors show a larger percentage rate of employment loss than the service sector as a whole. Detail in the business and professional services sector reveal a sharp drop in employment services (temporary help), and a relatively sharp downturn in architecture and engineering. The downturn in investment is undoubtedly related to declines in architecture and engineering. Employment in education and health care continues to show gains, counter to the broad-based downturn in services employment.

Table 7 Change in Employment in the United States December 2007 through Third/Fourth Quarter 2009 (Nonfarm payrolls, seasonally adjusted, thousands of jobs)

	Dec. 2007	Feb. 2010	Change	% Change
Total	138,078	129,588	-8,490	-6.1%
Private	115,745	107,131	-8,614	-7.4%
Goods Producing	21,976	17,829	-4,147	-18.9%
Natural Resources and Mining	739	690	-49	-6.6%
Construction	7,465	5,577	-1,888	-25.3%
Manufacturing	13,772	11,562	-2,210	-16.0%
Durable Mfg	8,739	7,065	-1,674	-19.2%
Nondurable Mfg	5,033	4,497	-536	-10.6%
Service Providing	116,102	111,759	-4,343	-3.7%
Private Service Providing	93,768	89,302	-4,466	-4.8%
Wholesale	6,072.9	5,559.9	-513	-8.4%
Retail Trade	15,487.8	14,417.4	-1,070.4	-6.9%
Transportation and warehousing	4,539.9	4,133.3	-406.6	-9.0%
Utilities	557.1	558	0.9	0.2%
Information	3018	2,738	-280	-9.3%
Financial Activities	8252	7,620	-632	-7.7%
Finance	3,756.7	3,376.1	-380.6	-10.1%
Insurance	2,466.5	2,287.6	-178.9	-7.3%
Real Estate	2,193.9	1,956.1	-237.8	-10.8%
Professional and Business Services	18,131	16,551	-1580	-8.7%
Legal	1,173.9	1,105.7	-68.2	-5.8%
Accounting	993.3	915.1	-78.2	-7.9%
Architecture & engineering	1,460.4	1,281.9	-178.5	-12.2%
computer servcies	1,391.4	1,438.3	46.9	3.4%
Consulting	994.3	984.9	-9.4	-0.9%
Management of companies	1,847.8	1,818.6	-29.2	-1.6%
Administrative & waste serv.	8,462.8	7,316.5	-1,146.3	-13.5%
Employment services	3,566.9	2,669.8	-897.1	-25.2%
Education	2,984.5	3,119.2	134.7	4.5%

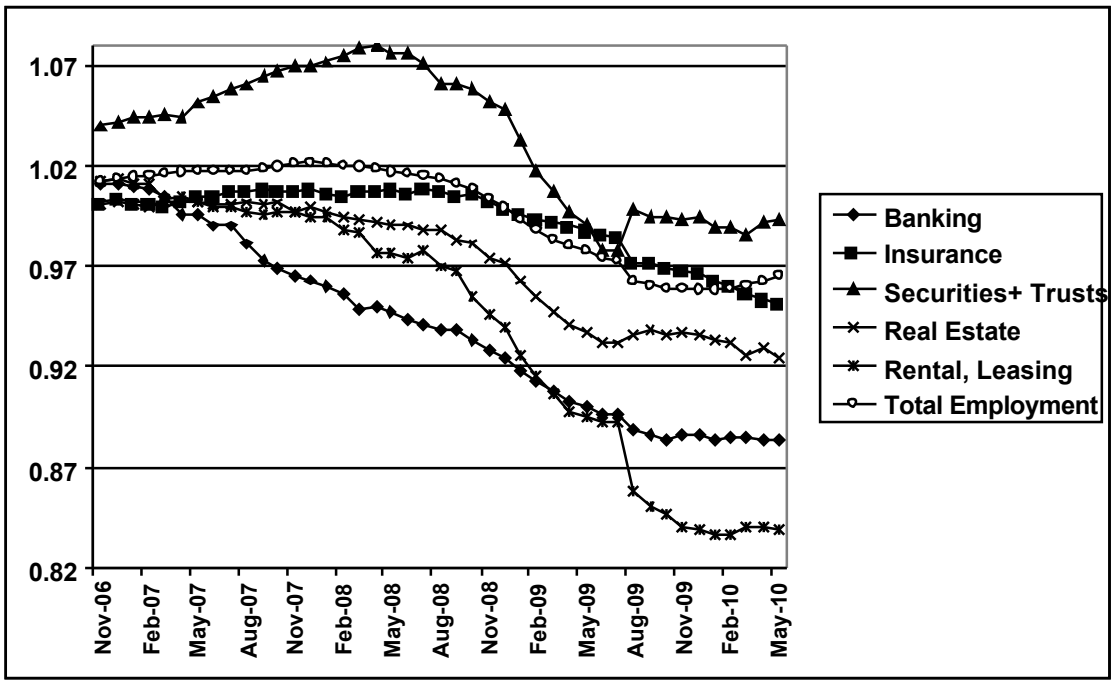
Health Care & Social Assistance	15,583.2	16,277.4	694.2	4.5%
Leisure & hospitality	13,635	13,019	-616	-4.5%
Arts, entertainment & recreation	2,010.3	1,893.2	-117.1	-5.8%
Accommodation	1,858.1	1,726.6	-131.5	-7.1%
Food Services & drinking places	9,766.6	9,399.2	-367.4	-3.8%
Other Services	5,507	5,308	-199	-3.6%
Government	22,333	22,457	124	0.6%
Federal	2,735	2,863	128	4.7%
State	5,153	5,171	18	0.3%
Local	14,445	14,423	-22	-0.2%

Source: U.S. Bureau of Labor Statistics, Table B-3 Employment and Earnings

Figure 9 shows detail on monthly employment in the financial services sector, an area clearly associated with the current economic downturn in the United States. This figure shows employment levels indexed against January 2006, nearly two years before the employment peak associated with the statistical beginning of the current recession (December 2007). Banking, and real estate rental and leasing, had peak employment in December 2006; real estate employment peaked in May 2007, while insurance employment peaked in December 2007. Thus, many key financial sectors were on the downturn well before the economy as a whole, and have fallen much more than the economy as a whole. Security brokerages and trusts continued employment expansion until April 2008, but since that date have dropped strongly, now matching the overall rate of employment decline (4.6% from the December 2007 employment peak).

Kirkegaard's analyses of the financial sector indicates that commercial banking, depository credit intermediation, and funds, trusts, and other financial vehicles have had structural gains, while nondepository and activities related to credit intermediation, security brokerages, and rental and leasing services have had structural losses. Real estate and insurance carriers were procyclical and countercyclical, respectively. The declines in the information sector were led by structural losses in publishing, broadcasting except the internet, and telecommunications. In contrast, data processing, motion picture and sound recording industries and other information services posted structural gains (Kirkegaard 2009, Figures 16 and 17).

Figure 9 Employment Indices: Financial Sectors and Total Employment (January 2006 = 1.0)

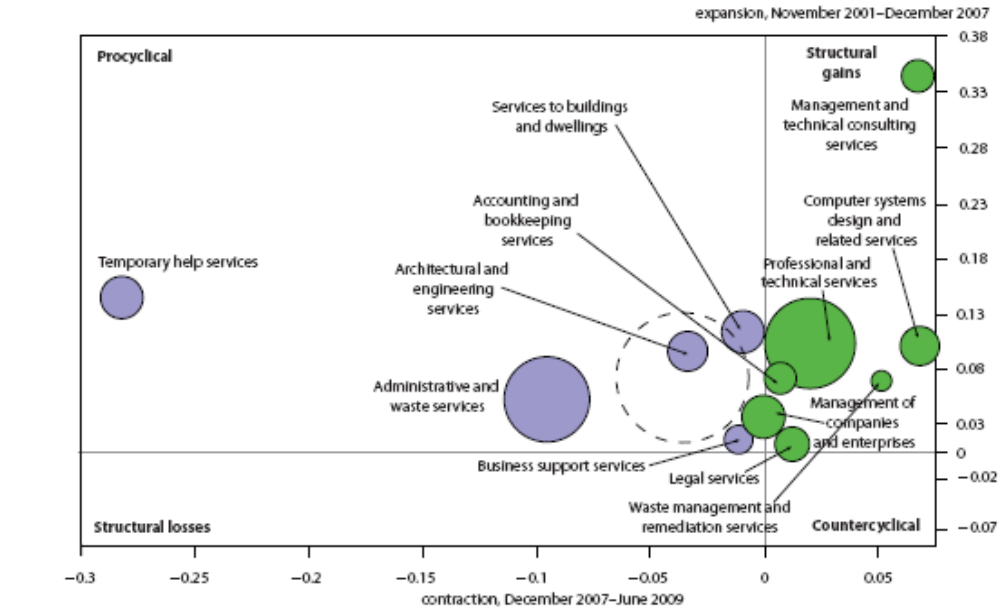


Source: Calculated by author from BLS data.

While the financial services sector may have been a leader in drawing the U.S. and the global economy into recession, Table 7 makes it clear that the downstream impacts have been much stronger in goods production, as investors and consumers reduced their spending on commodities. A model of these relationships will be presented later in this paper.

Kirkegaard's analysis of the professional and business services sectors reveals a pattern not unlike that reported by Rubalcaba-Beremejo for Europe. Figure 10 indicates counter-cyclical trends for many lines of professional and business services (green circles), and procyclical trends for some sectors, led by temporary help services (similar to that reported by Rubalcaba-Beremejo in Figure 5 above, and as reported in Table 7 for the U.S. in the current downturn). The downturn in construction no doubt is related to the procylical position of architectural and engineering services, while general economic downturn is likely related to weakened demand for services supporting general business activity (administrative and waste services, business support services, legal services, services to buildings and dwellings, and accounting and bookkeeping services).

Figure 10 Structural and cyclical employment trends in the professional and business services sector, by detailed industry



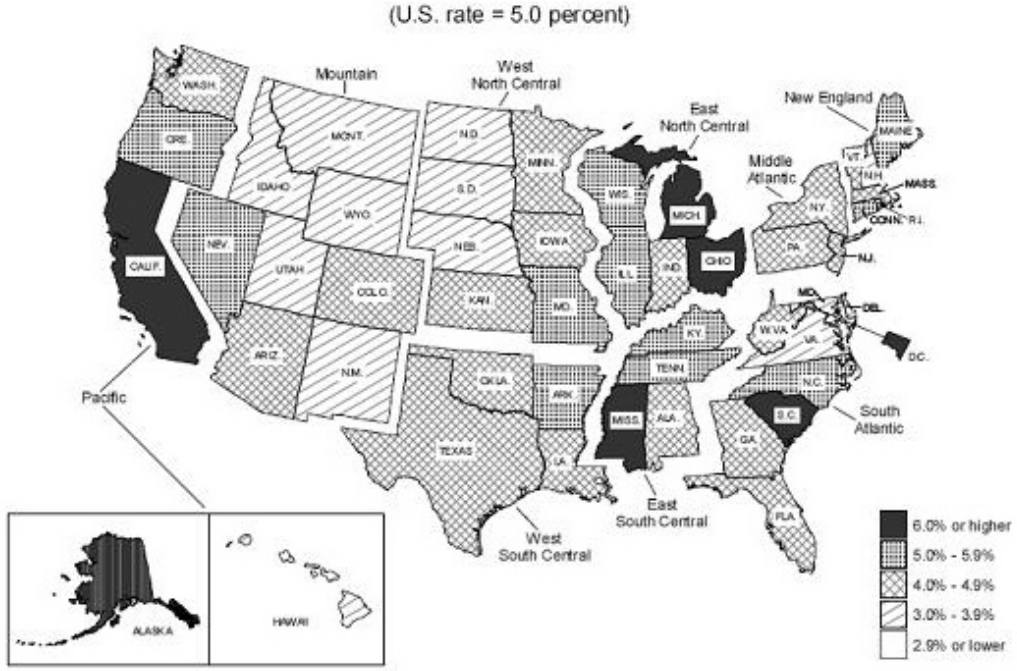
Note: The dashed bubble represents the entire professional and business services sector.
Source: Author's calculations based on BLS CES database.

Source: (Kirkegaard 2009, Figure 18, p. 39).

3. State Trends in the United States

Originally the author had hoped to develop a database of unemployment by sector at the state level, but these data were not available. Data were available on employment by state for December 2007 and February 2010. Location quotients were calculated for states by sector. Data on unemployment by state were also accessed from the BLS. Analyses were conducted to evaluate the relationship between industry concentration, as measured by location quotients, and unemployment levels. Figures 11 and 12 below show the level of unemployment by state in December 2007 and April 2010. Nationally, BLS data indicate a rise in U.S. unemployment from 5% to 9.9% over this time period. Figure 11 shows unemployment at or above the national average concentrated in many states in the old Industrial Belt, California, Oregon, Nevada, Mississippi, South Carolina, and several

Figure 11 Unemployment rates by state, seasonally adjusted, December 2007



Source: U.S. Bureau of Labor Statistics

Figure 12 Unemployment rates by state, seasonally adjusted, April 2010

Source: U.S. Bureau of Labor Statistics

states bordering the old Industrial Belt. Figure 12 shows current unemployment rates, and it shows a pattern not unlike that in Figure 11. In fact, the unemployment rate in December 2007 is an excellent predictor of unemployment rates in April 2010, as shown in Table 8 below. This table indicates a very strong correlation between unemployment levels in December 2007 and April 2010, and a slightly weaker relationship between the change in unemployment rates and unemployment in December 2007.

Table 8 Correlations of Unemployment Statistics United States

Correlations

		UNEMAP10	CHUN0710	UNEMDE07
UNEMAP10	Pearson Correlation	1	.887**	.706**
	Sig. (2-tailed)	.	.000	.000
	N	51	51	51
CHUN0710	Pearson Correlation	.887**	1	.298*
	Sig. (2-tailed)	.000	.	.033
	N	51	51	51
UNEMDE07	Pearson Correlation	.706**	.298*	1
	Sig. (2-tailed)	.000	.033	.
	N	51	51	51

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Calculated by author from BLS statistics.

Analyses were conducted of the concentration of employment in major industries and unemployment rates in December 2007 and June 2009. Table 9 reports statistically significant results from these analyses. Interestingly, there are few significant correlations between the concentrations of particular sectors and the state unemployment rates in June 2009 or their change from December 2007. Not reported in this table are correlations with the December 2007 unemployment rates and the location quotients for major industries. There was a statistically significant negative correlation between the unemployment rate and construction activity in December 2007. Thus, states with strong concentrations of construction activity in December 2007 tended to have low unemployment rates. However, by June 2009 this relationship disappeared. Only the location quotients in the professional sector show a significant positive correlation with unemployment rates in June 2009, and with their change from December 2007 to June 2009. Thus, states with a high concentration of employment in the business and professional services tended to have relatively high unemployment rates in June 2009, and had relatively high increases in their unemployment rate from December 2007. Government shows the reverse relationship—states with strong concentrations of government employment tended to have lower changes in their unemployment rate from December 2007 to June 2009. This latter finding is not unexpected, given the counter-cyclical role of government in business cycles.

Table 9 Correlations between State Location Quotients, April 2010 Unemployment Rates, and Change in Unemployment Rate from December 2007 to April 2010

Correlations

		CONSTRU	MFG	FINANCE	BUSISER	LQDUR07	LQNOND07	UNEMAP10	CHUN0710
CONSTRU	Pearson Correlation	1	-.378**	-.107	-.102	-.316*	-.346*	-.070	.143
	Sig. (2-tailed)	.	.006	.453	.475	.024	.013	.627	.318
	N	51	51	51	51	51	51	51	51
MFG	Pearson Correlation	-.378**	1	-.016	-.384**	.907**	.741**	.121	-.007
	Sig. (2-tailed)	.006	.	.912	.005	.000	.000	.396	.961
	N	51	51	51	51	51	51	51	51
FINANCE	Pearson Correlation	-.107	-.016	1	.215	-.025	.019	-.089	-.003
	Sig. (2-tailed)	.453	.912	.	.130	.864	.893	.536	.982
	N	51	51	51	51	51	51	51	51
BUSISER	Pearson Correlation	-.102	-.384**	.215	1	-.279*	-.357*	.374**	.454**
	Sig. (2-tailed)	.475	.005	.130	.	.047	.010	.007	.001
	N	51	51	51	51	51	51	51	51
LQDUR07	Pearson Correlation	-.316*	.907**	-.025	-.279*	1	.510**	.217	.129
	Sig. (2-tailed)	.024	.000	.864	.047	.	.000	.126	.367
	N	51	51	51	51	51	51	51	51
LQNOND07	Pearson Correlation	-.346*	.741**	.019	-.357*	.510**	1	-.037	-.138
	Sig. (2-tailed)	.013	.000	.893	.010	.000	.	.798	.333
	N	51	51	51	51	51	51	51	51
UNEMAP10	Pearson Correlation	-.070	.121	-.089	.374**	.217	-.037	1	.887**
	Sig. (2-tailed)	.627	.396	.536	.007	.126	.798	.	.000
	N	51	51	51	51	51	51	51	51
CHUN0710	Pearson Correlation	.143	-.007	-.003	.454**	.129	-.138	.887**	1
	Sig. (2-tailed)	.318	.961	.982	.001	.367	.333	.000	.
	N	51	51	51	51	51	51	51	51

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Calculated by author from Bureau of Labor Statistics data

Correlations

		TTU	EDUCHEAL	LIESURE	GOVT	UNEMDE07	UNEMAP10	CHUN0710
TTU	Pearson Correlation	1	-.130	.041	-.541**	-.186	-.219	-.174
	Sig. (2-tailed)	.	.362	.775	.000	.192	.123	.222
	N	51	51	51	51	51	51	51
EDUCHEAL	Pearson Correlation	-.130	1	-.411**	-.234	-.040	-.154	-.181
	Sig. (2-tailed)	.362	.	.003	.098	.778	.281	.204
	N	51	51	51	51	51	51	51
LIESURE	Pearson Correlation	.041	-.411**	1	-.127	.038	.222	.274
	Sig. (2-tailed)	.775	.003	.	.374	.791	.118	.052
	N	51	51	51	51	51	51	51
GOVT	Pearson Correlation	-.541**	-.234	-.127	1	.004	-.223	-.303*
	Sig. (2-tailed)	.000	.098	.374	.	.977	.116	.031
	N	51	51	51	51	51	51	51
UNEMDE07	Pearson Correlation	-.186	-.040	.038	.004	1	.706**	.298*
	Sig. (2-tailed)	.192	.778	.791	.977	.	.000	.033
	N	51	51	51	51	51	51	51
UNEMAP10	Pearson Correlation	-.219	-.154	.222	-.223	.706**	1	.887**
	Sig. (2-tailed)	.123	.281	.118	.116	.000	.	.000
	N	51	51	51	51	51	51	51
CHUN0710	Pearson Correlation	-.174	-.181	.274	-.303*	.298*	.887**	1
	Sig. (2-tailed)	.222	.204	.052	.031	.033	.000	.
	N	51	51	51	51	51	51	51

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

It is surprising that states with strong concentrations of manufacturing employment did not exhibit a larger than average level of unemployment or increase in the level of unemployment, given the large job losses that have occurred in the manufacturing sector. This result means that job losses associated with manufacturing were widely distributed across the states, and/or non-manufacturing job losses contributed to the overall pattern of job change in ways unrelated to the concentration of manufacturing employment.

Table 9 reveals many significant statistical relationships between the concentrations of industries. States with concentrations of manufacturing industry tended to have weaker concentrations of employment in the business and professional services sector, and in leisure, government, and other employment. In contrast, the states with strong concentrations of manufacturing also tended to have strong concentrations in employment in trade and transportation services. States with strong concentrations of construction activity tended to have strong concentrations in trade and transportation as well as leisure—likely a reflection of growth in states with large retirement populations or concentrations of gambling and amusements (such as Nevada and Florida).

What lessons are there from this analysis in the United States in this recession? First, the problems that started in the housing sector with lending practices that were unsustainable financially for both homeowners and lenders were evident early on in parts of the financial services industry. Second, as employers saw demand begin to erode for a broad array of goods and services they responded with downturns in the levels of production and employment. Third, this downturn was not confined to goods production, but has been felt equally by the services sector. Fourth, while the downturn in jobs has been roughly equal between goods and services production, the percentage impact within services has been much lower than in the goods producing (and distributing) sectors. Thus, the current efforts of the Obama administration to stimulate the economy are largely aimed at reviving consumer demand and investment, so as to rekindle employment and production.

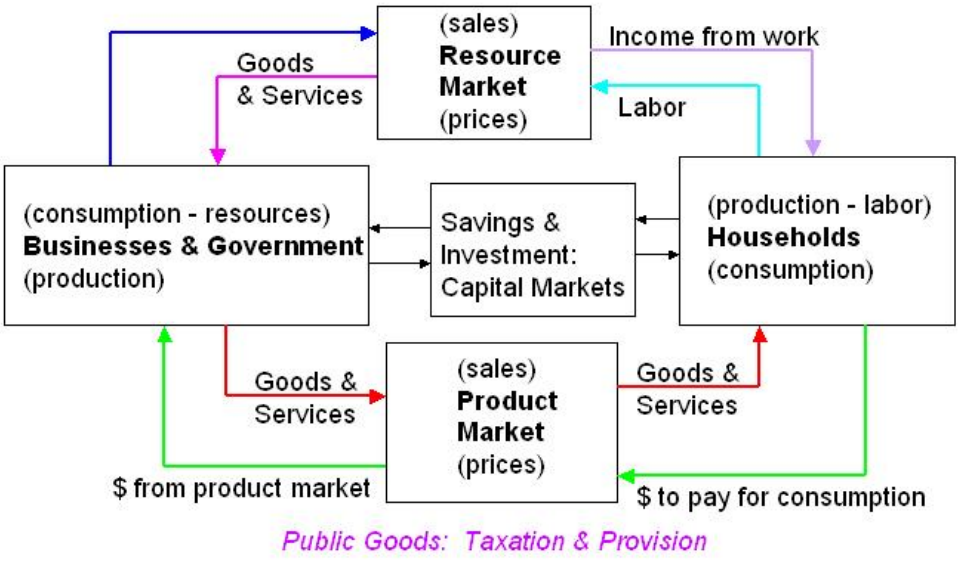
This paper will be edited beyond this point before the ERSA meetings

IV. A model for this downturn

Figure 13 presents a familiar diagram linking consumption to production, and the flow of funds, goods, and services. This model should be seen as set in time and space, and in todays interdependent world, each arrow implicitly is tracking interregional and international flows of goods and services and funds. Thus, what started as a downturn due to inappropriate financial practices in the United States housing market quickly spread to the global economy due to these linkages. Each of the arrows in this model should be seen as a flow whose magnitude is influenced not just by simple linear equation relationships, but by policies and behaviors influenced by expectations and experiences—such as becoming unemployed.

Thus, today we find savings rates in countries like the U.S. rising to levels not seen in decades, as people are unable to find lending opportunities or fear the loss of future income. Not captured in the arrows in this model are the impacts of public policies that regulate or influence the costs of the elements of this model, through fiscal stimulus packages, tax policies, and other incentives to impact demand (such as the infamous "cash for clunkers" program that had wild success in jump-starting the demand for fuel efficient automobiles in the United States recently). When confidence rebuilds, either through public policy or shifts in consumer behavior, the magnitudes of the flows in this system will begin to expand, and the employment cycle will move in the direction of job creation. Clearly, this is a process of adjustment that is affecting almost all of the OECD countries, and global patterns of exports and imports.

Figure 13 The circular flow of production and consumption



We can calibrate the flows in this model with hindsight, through systems of national accounts, and measures of international trade. The changing role of services in the recovery that is anticipated has been debated. Kirkegaard's analysis of recent patterns of structural adjustment finds relatively few sectors that have been exhibiting structural gains, such as health care and food services and drinking places (Kirkegaard 2009). However, students of business cycles have tended to focus very much on the role of consumers and consumer demand, and have tended to overlook the bases of demand for producer services. These demands are contained in the three boxes outside the household box in Figure 13, and as Rubalcaba-Bermejo reminds us, the systematic expansion of the producer services has come about through a variety of forces expanding the relative size of business services (Rubalcaba-Bermejo 1999). This ongoing expansion of the division of labor is likely to continue to occur, and it is interesting to note the rich array of structural gains documented by Kirkegaard in these sectors in the current business cycle (see Figure 10). It would be very interesting to have data allowing us to develop for an international or interregional system the linkages captured in Figure 13 over the course of the current downturn, but more importantly, in the recovery phase that may be beginning.

V. Concluding Comments

This paper has used very current statistical information to provide an overview of employment trends in OECD countries and within the United States in the current global downturn. It has highlighted the role of services in this business cycle. With the long-run shift of employment to service industries, the impact of that shift on business cycles has not gone unnoticed. The general argument has been made that business cycles are less dramatic in a service-dominated era due to less wild swings in the demand for services. Data presented for OECD countries confirms this trend in the current recession. The model presented above in section IV of this paper anchors that view of demand with consumers, but as the relative importance of producer services has expanded, it is important to examine how this sector is affected by business cycles.

The data for the United States show the information, financial services, and business and professional services sectors have had relatively large employment downturns in the current recession. The largest of these impacts appear to be related to relatively contingent sectors, such as temporary help, or to sectors whose demand is linked to construction such as architecture and engineering. Just as linkages within the manufacturing sector have ripple effects when output of products such as automobiles drop precipitously, we should expect that services linked to the production of goods such as housing will be affected when housing markets drop. Analysis of market structure for advanced services from sources such as input-output models may be helpful in identifying potential demand impacts of business cycles on advanced services.

Current sector specific data for OECD countries were not available for the purposes of this paper, comparable to those available for the U.S. on an almost real-time basis. The types of analysis done for the U.S. with regard to the current business cycle could be repeated for OECD countries and for Europe when such data become available. Differences in national production systems will likely temper such analyses. Likewise, the industrial composition of unemployment both at the OECD level and within countries such as the United States at a state level remains unstudied. If we had these data, it would be possible to construct accounts for models similar to Figure 13, focusing on *changes* in business activity, as opposed to cross-sectional models that can be derived from national accounts.

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