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Childcare Markets and Maternal Employment: A Typology

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Abstract

How does the structure of a country's childcare market influence maternal employment? Childcare markets vary across countries, leading mothers to rely on various forms of care depending on what is available to them in both the public (state-provided) and private (non-state) childcare markets. Maternal employment is higher in countries that combine comprehensive childcare policies with an available and affordable private care market. When aspects of either the public or private market are lacking, the employment of mothers, and especially mothers with young children, is lower. This paper proposes a four-fold classification scheme based on the type of "penalty" that women experience in the labor market as mothers. It then links each penalty to distinct policy structures of childcare markets, and shows that the four penalties are visible at both the country and individual level. By articulating how public and private care markets work in concert to shape maternal employment, this paper adds to a literature that to date has focused primarily on the role of public childcare in reconciling work and family.

Keywords: childcare policy; private childcare; maternal employment; work-family reconciliation; child penalty

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Introduction

How does the structure of a country's childcare market influence maternal employment? Mothers rely on state-provided care ("public care") and care provided in the formal private market ("private care") to enter paid employment. Their ability to do so is based on the availability and affordability of care. These various forms of care, which define the structure of a country's childcare market, in turn correspond with maternal employment patterns at both the country (macro) and individual (micro) level. Previous research has largely emphasized the role of state-provided or state-subsidized care, leading to an inadequate conceptualization of the problems of employed mothers, who face different types of penalties based on the combination of public and private childcare options available to them. This under-specification makes it difficult to design policies to ameliorate problems of work-family balance. This paper advances the literature in two ways: by disaggregating the group of countries where employed mothers face a penalty, and by showing why different policies matter. Along the way, it identifies potential reasons for the scarcity of research on the role of private childcare provision.

Governments have responded in different ways to the changing employment dynamics of mothers. Sometimes governments provide care directly, such as in in France. In countries like Denmark, care choices bridge the public and private markets, as governments serve as regulators and subsidizers of care provided in the market. In other cases, like the United States, governments provide minor benefits through the tax system, but mostly leave families to acquire childcare in the marketplace. Despite low governmental spending on childcare, working mothers in the United States have more children than their counterparts in other countries, and work longer hours and more weeks (LIS, author's calculation). Incorporating public and private care into theories of work-family reconciliation helps us to understand why.

When public and private childcare provisions are viewed as a pair, countries fall into distinct groups based on availability and affordability. Put simply, the differences in the employment patterns of women and mothers are narrower in countries with deeper childcare markets spanning both the public and private markets and wider in countries lacking either a robust public market or a robust private market. Countries cluster into four distinct groups based on the "child penalty" they exhibit, or in other words the difference associated with the work patterns of mothers as compared to women as a whole, or in some cases, between mothers of younger and older children. Countries with a small-to-non-existent child penalty – the 'zero penalty' group – are those that combine comprehensive childcare policies with an available and affordable private care market. The other three groups each lack one or more component of comprehensive childcare, but generate the ideal types of a traditional child penalty, a female penalty, and a young child penalty.

Mothers, as opposed to fathers, are typically viewed as the second earner and have a disincentive to work if the cost of care approaches net wages. They also face high barriers to entry in the paid market if care is not readily available, either because demand outpaces supply or because care facilities are not located within reasonable distances of the workplace or the home. Historically and today, mothers spend more time caring for children and associated family tasks than fathers (Cleveland et al., 2015). In this way, government policies promoting childcare help to reduce the penalty faced by mothers who want to remain in or re-enter the paid market.

Understanding the motivating forces behind maternal employment is important for at least three reasons. At the policy-level, losses in human capital occur when women exit the market, lowering economic growth (OECD, 2012). At the personal-level, lower levels of market attachment create conditions for statistical discrimination by gender in the workplace (Pettit and

Hook, 2009). And, the inability to easily combine work and family makes it difficult to attain desired family size (Adema and Whiteford, 2007), which at the policy-level strains social welfare systems that rely on stable or increasing populations, and at the personal-level complicates one of the most important decisions families make: how many children to have.

The distinction between public and private childcare is undeniably blurry. It is difficult to demarcate when care is fully unsubsidized in the market, especially since subsidies are often provided to families directly. This paper follows the OECD's strategy, considering whether the *provision* of care is public (state-run), private (market-based for-profit and nonprofit organizations), or informal (e.g. provided by friends, relatives, nannies, etc.). Childcare solutions are housed in formal childcare centers, family daycares, and early childhood education programs, or are provided within the home by nannies, relatives, and sometimes by the children themselves.

Drawing on the current literature, this paper argues that two key mechanisms – availability and affordability of childcare – link care markets to maternal employment. Departing from the current literature, this paper places equal emphasis on the availability of care in both the public and private markets. It proceeds as follows. First, it sketches the current understanding of public-private care dynamics. It introduces a new four-fold classification scheme emphasizing the interaction of care markets and maternal employment. Second, the paper describes female employment outcomes in terms of engagement (whether one works) and employment intensity (how many hours) across 18 countries using data from the Luxembourg Income Study (LIS). In a macro-level analysis it shows that countries empirically cluster together based on care markets and maternal employment rates. In a micro-level analysis it finds that care markets statistically predict engagement and employment intensity. Third, the paper concludes with a call for the

development of additional measures of the childcare market, offering thoughts on what a complete measure of the childcare market might look like.

What Links Care Markets to Maternal Employment?

Two key mechanisms link care markets to maternal employment: the availability of care options and the affordability of these options. Neither mechanism is dependent on the provision of care in the public market exclusively. Yet most existing research adopts a frame emphasizing state-provided or subsidized care options. This section outlines some of the major strands in the literature linking childcare policies to maternal employment, pointing out the unequal attention paid to public care markets. It then offers a typology to link childcare markets to maternal employment that places equal emphasis on the availability of care in both the public and private markets.

Perhaps in part because of the conceptual and methodological difficulties of disentangling public and private care, scholars have adopted different strategies to assess the impact of policies. Some scholars adopt an index-based approach. Others consider policies individually. In both cases, the public components of care markets are disproportionately emphasized compared to private components. An additional strand in the literature emphasizes policies and labor market structures that influence private provision of care, but by viewing private care as a dependent variable cannot answer questions about the role of care in shaping employment.

Meyers et al. (1999) and Gornick and Meyers (2003) create a set of indices linking childcare and maternal employment. Indices represent the generosity with which governments support maternal employment. Policies represent entitlements to and availability of public

childcare, tax relief for private childcare, and characteristics of the parental leave system. Indices are linked to what the authors term a country's child penalty: the difference in the labor market status of mothers with young children to those with older children. They find that in those countries with child penalties (Australia, Canada, Germany, the Netherlands, Norway, the UK, and the U.S.) fewer policies exist to support maternal employment. Those countries without a child penalty (Belgium, Denmark, Finland, France, Italy, Luxembourg, and Sweden) have more generous policies. Lambert (2008) uses a similar index of employment policy, but flips the analysis around to explain how a country arrives at a particular combination of maternal employment policies. In each case, indices are primarily based on publicly provided or subsidized care.

Other scholars emphasize the role of individual policies in alleviating the work family tradeoff, either through detailed policy overviews (Kamerman, 2000; Waldfogel, 2001) or empirical analyses of specific policies (Pettit and Hook 2009). For instance, Pettit and Hook find that childcare policies increase the employment of women with young children, increase the representation of women in professional sectors of the labor market, and lessen the effect of education on employment, meaning that women with less education are more likely to work than would otherwise be expected. Here too, the discussion and measures revolve largely around the role of public childcare.

A third strand of scholarship identifies the government subsidies, childcare tax deductions and credits, or vouchers for childcare that influence private provision. Cleveland and Krashinsky (2003) consider supply and demand side subsidies linked to private care, and identify the presence and generosity of these supports in 17 countries. Kamerman and Gatenio-Gabel (2007) and Brennan (2007) provide similarly-framed country-specific studies for the United

States and Australia, respectively. Hofferth (1999) emphasizes the role of employers' policies in influencing mothers' work incentives.

In many cases, private childcare markets are seen as a byproduct in the absence of public childcare markets (Esping-Andersen, 1999; Del Boca, 2004 et al.; Morgan, 2005). For instance, when labor costs are high and wages more equal, private care markets are unlikely to develop because the cost of care will approach a second earner's wages. Governments can either develop a care market by serving as a provider of care (e.g. France) or subsidize care in ways that enable a private care market to develop (e.g. Denmark). Countries in which governments fail to do either will have small and expensive private care markets, as is the case in Southern Europe. In countries where labor costs are lower and wage disparities are greater, private care markets can develop unaided. Governments are let "off the hook" in providing or subsidizing care (Morgan, 2005). The United States is the archetypal example. These studies provide valuable descriptions of how government influences the cost and supply of care in the private market. Most, however, do not focus on the next leg in the causal chain: how the cost or supply of care in the private market affects employment.

Despite the relative lack of attention on private markets in the scholarly literature, many parents rely on it. Of the eighteen countries discussed below, the care markets in eight (Australia, Austria, Canada, Ireland, the Netherlands, Switzerland, the United Kingdom, and the United States) are primarily serviced through the private market for children up to and sometimes including the age of three (OECD, 2010). In these countries, the participation rate of children under three in childcare and pre-school services ranges from a low of 20% in Austria to a high of 55% in the Netherlands (OECD, 2015). In other words, in many countries the number of parents who rely on private services is non-trivial. It is in some ways puzzling, then, that theoretical and

empirical studies primarily emphasize the public side. Upon closer inspection, three possible reasons exist. One is related to mechanisms, one to quality, and one to data availability.

The literature emphasizes, sometimes implicitly and sometimes explicitly, the importance of the availability and affordability of childcare in alleviating tradeoffs between work and family (Kreyenfeld and Hank, 2000). Perhaps private care is omitted because one or both of these mechanisms are absent in the private care market? For instance, scholars have found care is more expensive and supply more limited in countries with little government involvement in the childcare market (Richardson, 2012). And it is generally accepted that public care is a necessary component of affordable care. Rianne Mahon notes that, "[t]he emergence of the dual-earner family challenges states to take on new responsibilities as families can no longer provide full-time care, nor can they afford to rely exclusively on markets" (Mahon, 2002: 343). But by focusing primarily on public care, the literature often conflates mechanisms with policy tools. Private care is not by definition unavailable or unaffordable just as public care is not by definition available and affordable. This paper thus focuses on both mechanisms and policy tools (in this case types of childcare markets) to posit that availability and affordability are conceptually and empirically relevant to both public and private care markets.

A second possibility is that private market care is suboptimal to public care. Characterized by fewer regulations, private care is likely to vary in quality (Vandell and Wolf, 2000). Low quality care can have negative consequences on child development in the short term and human capital in the long term (Philips and Adams, 2001). It may also be more susceptible to heightened inequality between families of different income levels and ethnicities (Hemerijck, 2002). On the other hand, public care may have added benefits, especially for children from low-income families (Garces et al., 2002).

The literature clearly demonstrates that low quality care has negative implications on child development. But, private care is not low quality by definition. In Australia, a country with primarily private provision of childcare services for children three and under, the government measures a number of standards across childcare facilities. Low performance in some areas (e.g. 21% of services were rated as unsatisfactory in assisting each child to be a successful learner) lead to reform of the system, which began operating under the National Quality Framework (NQF) in 2012. The NQF introduces requirements and tracks progress in key areas including staff qualification, staff to child ratios, and safety requirements (Early Childhood Australia, 2014). Increased regulations such as those in the NQF can begin to address concerns of quality. Likewise, public care is not the complete solution to maternal employment and gender inequalities. Even in the Scandinavian countries generous childcare policy is not enough to move women into the paid market on its own – governments themselves often serve as the employer of women, leading to gendered job segregation (Charles and Grusky, 2004).

A third possibility is simply the lack of data. Research on childcare is mostly derived from OECD estimates, which focus on the public childcare market. Enrollment data typically include care that is performed in publicly operated facilities, usually in formal care centers or through pre-school and early education programs. This underestimates enrollment in countries with large private markets. Data on government spending includes public financial support (in-cash, in-kind, and through the tax system) meaning that some, but not all, private market components are included. Out-of-pocket costs are simulated based on formal care centers which exist in both the public and private market, but the cost of care measure is not generalizable to types of care beyond formal care. OECD data that explicitly concentrates on private childcare lacks nuance, only indicating if provision of care is primarily public or primarily private for a

given age (OECD, 2010). Some exceptions exist (e.g. Esping-Andersen, 2002 and Gullet 2005), but one of the most plausible reasons for the lack of research on private care is practical rather than conceptual. The rest of this paper highlights the utility of including private care in theory building and empirical modeling, even when data are broad.

Three conclusions can be drawn from the current literature. First, most scholars emphasize the effect of public care options. Second, those who focus on private care often do so to explain why private care markets develop. Third, the likely reason for the lack of studies on private care is based on data availability. Indeed, the dimensions likely to enable women to combine paid employment with family responsibilities should be based on the availability and affordability of childcare options across multiple types of markets, both public and private. Thus, this paper posits a four-fold classification scheme to link care markets to maternal employment. Figure 1 illustrates this scheme. For sake of simplicity, care markets are identified as either available or not (the dimension identified along the top of the table) and as either affordable or not (the dimension along the side of the table). In practice, there are varying levels of availability and affordability.

Figure 1. Childcare Market Types

		Is Care Available?	
		No	Yes
Is Care Affordable?	Yes	Affordable care options exist, but supply does not meet demand *Corresponds with Female Penalty*	Affordable care can be secured through multiple sources *Corresponds with No Child Penalty*
	No	Care is difficult to secure, and expensive when found *Corresponds with Traditional Child Penalty*	Care is available, but only for those segments that can afford it *Corresponds with Young Child Penalty*

Source: Author's conceptualization

To preview the findings of the paper, the typology identifies the ideal types corresponding to each care market. Care markets can exist in the public sphere, the private sphere, and the informal sphere (e.g. care by grandparents). Countries with deep childcare markets spanning both public and private markets (the top right quadrant) are thought to have *no child penalty*. Because childcare is both available and affordable, mothers should not exhibit widely different employment patterns than women as a whole. The Scandinavian countries exemplify this pattern. In the opposing quadrant (bottom left) where care is neither readily available nor affordable, care markets have not developed or been prioritized by governments, even as female employment has increased. In absence of formal care markets, women feel a penalty labeled as a *traditional child penalty*. Women exit the market when they become mothers, and because care markets are limited, mothers with older children face barriers when re-entering the market. This leads to a step-like pattern in employment rates. Continental countries like Germany exhibit this pattern. In both of these cases, informal care markets (e.g.

care by grandparents) are somewhat uncommon. In the case of the Scandinavian countries, robust public and private markets make an informal market unnecessary. In the case of the continental countries, the absence of an informal market further exacerbates work-family tradeoffs.

In cases where care is available but not affordable (bottom right), women who exit the market when they become parents are more capable of re-entering the market when their children are older. This penalty is thus labeled a *young child penalty.* Because care is more available than in the traditional penalty ideal type, attachment to the market is greater among all groups, women and mothers with children of various ages. Anglo countries typically exhibit this pattern of employment recovery. And finally when the opposite pattern occurs, where care is affordable but unavailable (top left), affordable care options are not common enough to enable widespread maternal employment. Labeled as a *female penalty*, this ideal type is the most difficult to classify. The countries of Southern Europe fall here, and perhaps because of a rigid labor market, all women exhibit lower attachment to work. In both this ideal type and that with a young child penalty, informal markets are common, as grandparents step in to provide care. This might also explain why maternal employment rates are not even lower in Southern Europe, and why rates in the Anglo countries receive an additional boost. The following sections use empirical data to show that care markets in both the public and private sector correlate with maternal employment, lending support to the typology in Figure 1.

Data and Methods

The empirical portion of this paper assesses whether care markets in both the public and private sphere correlate with maternal employment in 18 rich OECD countries. It does so by

presenting findings from two analyses, one conducted at the macro (country) level and one conducted at the micro (individual) level. Both use data from the Luxembourg Income Study (LIS) for employment patterns, and from the OECD and Gullett (2005) for measures of the childcare market. In each case, outcomes capture two aspects of female employment. The first captures engagement – whether a woman is currently in paid employment. The second captures intensity of employment through usual hours worked in a week.

The macro-level analysis proceeds in two stages. First, it presents female employment statistics for three overlapping groups: women, mothers, and mothers with young children. It classifies countries based on the ideal types identified in Figure 1 above. These groups are confirmed with an exploratory cluster analysis. Second, and using the groupings identified in the cluster analysis, it assess the similarities in care markets for each group. It does so by classifying three key dimensions of care markets – one representing the public market, one representing the private market, and one representing the cost of care – as either above or below the cross-country average. It shows clear patterns between availability and affordability of care on the one hand, and maternal attachment to the paid market on the other. In other words, this strategy groups countries based on the outcome of interest, and then assesses how well care markets correspond.

The micro-level analysis considers whether care markets at the country level explain variation in employment at the individual level. Individual-level data from the 18 countries are pooled (since care markets do not vary within countries) in logistic and ordinary least squares (OLS) regression analyses to assess the institutional level impact of care markets. The regressions use clustered standard errors since pooled data often violates the regression assumption that the errors are independently and identically distributed. In all analyses, private care markets are associated with similar changes in employment as public care markets.

Employment data from LIS are mostly for the 2004 income reference year: Australia, Austria, Belgium (2000), Canada, Denmark, Finland, France (2000), Germany, Greece, Ireland, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, and the United States. LIS maintains the largest cross-country database of microdata on the outcome of interest, and many scholars cited above utilized LIS data in their analyses. Sample sizes range from 905 in Belgium to 22,973 in the United States for a total sample size of 88,683. Country-level data from various OECD databases and Gullet (2005) are used for the year corresponding most closely to the LIS sample year.

These years are chosen for two reasons. At the time of this writing, LIS data for the countries under review are available for the years during, but not after, the financial crisis. Pre-crisis years provide a better base year for the analysis. Additionally, data on childcare configurations were collected during the early 2000s and have not all been updated. While using data pre-financial crisis is dated, it still enables a preliminary analysis of the hypothesis that private care markets can, and indeed do, influence maternal employment rates. By combining micro-level and macro-level data, it is possible to see how individual-level decisions are conditioned by institutional-level contexts.

Married or cohabiting women aged 25-45 are included in the sample. Including parental status offers a look at the extent to which motherhood disturbs attachment to the market. In the regression analyses, it can additionally be interacted with other variables to verify that relationships are operating as expected. In this case, childcare configurations should influence the employment decisions of mothers, but not those who are childless. The presence of a young child (under the age of three) is included to examine the likelihood that women with young

children have more difficulty combining work and family. Individual-level controls are included to account for the age, education, and household income level of the respondent.

Four different measures of childcare are included in the models: one measure of public childcare, one measure of private childcare, one measure of the cost that families incur when purchasing childcare, and one measure of the informal childcare market. Taken together, these are expected to capture multiple dimensions of a country's childcare system. Table 1 lists summary statistics for the four variables.

Table 1. Descriptive Statistics for Childcare Characteristics

	Mean	Std. Deviation	Minimum	Maximum	Total
Spending on childcare (% GPD)	0.6%	0.3	0.13	1.2	18
Cost of childcare (% of income)	17.6%	13.1	4.7	44.6	18
Level of private childcare (standardized)	-0.9	0.8	-1.8	0.9	18
Level of informal childcare (% enrolled)	22.2%	15.5	.58	52.5	18

Sources: OECD Social Expenditure Database; OECD Family Database; Gullett (2005)

The measure of public childcare captures the depth of the public childcare market by using the level of government spending on childcare programs as a percent of GDP. It is used as a proxy for availability of childcare in the public market. Government spending on childcare should increase the engagement of mothers in the market and the intensity of that engagement. Government spending is not expected to influence the employment patterns of non-mothers. The measure of private childcare captures the depth of the private childcare market by representing the percentage of children under three in privately run formal care as a standardized variable. Higher levels of private childcare should increase the engagement and intensity of maternal employment, and have no effect on the employment of non-mothers.

The cost of childcare measures the cost to secure childcare for two small children for a dual-earner family making 167% of average wages. Higher costs should discourage labor market participation and the employment intensity of mothers. Informal childcare is measured as the

percentage of children receiving informal care, often from relatives, but also from non-relatives (e.g. friends, neighbors, babysitters, and nannies). Informal care is less reliable and harder to secure for longer periods of time. It is often combined with other forms of care (OECD, 2007). If informal care is the only option available, greater reliance on it should lead mothers to work fewer hours or leave the market altogether.

Results

Research has consistently demonstrated that women face a tradeoff when combining work and family. Mothers in nearly every rich OECD country work less than women as a whole, and mothers with young children even less. How do employment patterns and care markets interact? This section offers a country (macro) and individual (micro) level perspective.

Child Penalties at the Country-level

Table 2 illustrates female employment rates by country. Employment rates and employment intensity are listed for three groups of the sample: women as a whole, mothers as a whole, and mothers with at least one young child. Countries are divided into categories based on the "child penalty" that women face in a given country. Gornick and Meyers (2003) use this term, and classify countries into two groups – those with and without a child penalty. The data here indicate that countries can be further divided into a four-fold classification: those without a penalty and those with a traditional child penalty, a young child penalty, or a female penalty.

Table 2. Female Employment Rates, Women, Mothers, and Mothers with Young Children

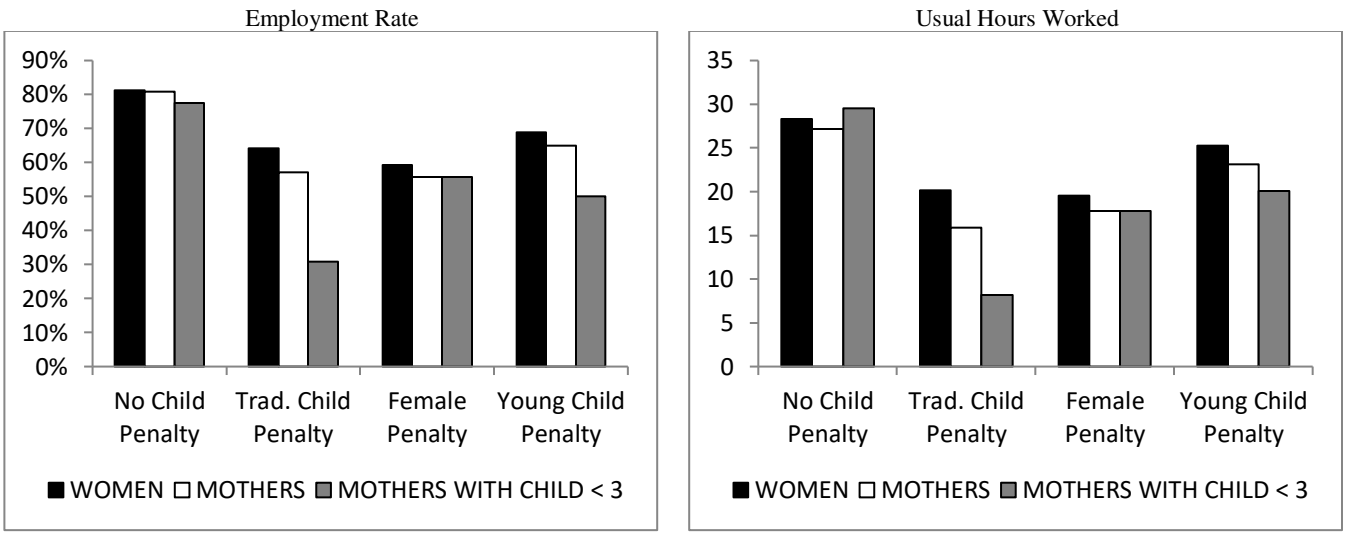
	Percent Employed			Usual Weekly Hours (Average)		
	Women	Mothers	Mothers with a child < 3	Women	Mothers	Mothers with a child < 3
No Child Penalty:						
Belgium	77%	74%	72%	28	27	30
Denmark	82%	83%	76%	--	--	--
Norway	84%	84%	84%	--	--	--
Sweden	82%	82%	78%	--	--	--
Average:	81%	81%	77%	--	--	--
Traditional Child Penalty:						
Austria	64%	59%	26%	22	19	9
Finland	73%	69%	34%	--	--	--
Germany	72%	65%	34%	22	17	7
Switzerland	48%	36%	29%	17	12	9
Average:	64%	57%	31%	19	14	9
Female Penalty:						
Greece	58%	58%	53%	22	21	20
Ireland	63%	59%	59%	19	17	17
Italy	55%	52%	51%	19	18	18
Netherlands	62%	56%	60%	17	14	15
Spain	59%	55%	56%	21	19	19
Average:	59%	56%	56%	20	18	18
Young Child Penalty:						
Australia	67%	61%	47%	19	15	10
Canada	71%	67%	49%	25	24	22
France	69%	66%	48%	33	33	33
United Kingdom	71%	65%	50%	24	20	15
United States	67%	65%	55%	25	24	20
Average:	69%	65%	50%	25	23	20

Source: Luxembourg Income Study

An exploratory cluster analysis confirms the existence of these groups, and the Wilks' lambda test indicates that the difference in means across the groups is statistically significant. Six variables are included in the cluster analysis: employment rate of women as a whole, the difference in employment among women and mothers, the difference in employment among

mothers and mothers with young children, weekly hours worked by women as whole, the difference in weekly hours worked between women and mothers, and the difference in weekly hours worked between mothers and mothers with young children. Because the inclusion of hours worked drops four countries from the analysis (including three countries from one grouping), a second analysis is conducted using only the three employment rate variables. In the second analysis the clusters between the four groups are even more distinct. Figure 2 highlights the differences across groups.

Figure 2. Employment Rates and Intensity



Source: Luxembourg Income Study

In Belgium, Denmark, Norway, and Sweden, motherhood is not associated with a child penalty. Employment rates are high regardless of parental status or age of children. In fact, the average employment rate of mothers with young children – the group where motherhood and employment is most difficult to reconcile – is higher than overall female employment rates in nearly every other country. These countries bring not just most women, but most mothers, into the labor market. Data on employment intensity are only available for Belgium, but it ranks second highest in the number of hours that mothers work. Aggregate OECD data point to a

similar dynamic in Denmark and Sweden, where almost 90% of working mothers work 30 hours or more, compared to the OECD average of less than 75% (OECD Family Database).

In Austria, Finland, Germany, and Switzerland, motherhood is associated with a traditional child penalty. Maternal employment rates are between five and twelve points lower than female employment rates. Employment rates for mothers with young children are an additional seven to thirty-nine points lower. Mothers in these countries work five fewer hours on average than non-mothers, and mothers with young children work ten fewer hours.

In Greece, Ireland, Italy, Spain, and the Netherlands, only small differences in employment patterns exist, but primarily because female employment rates are low to begin with (59% vs. a cross-country average of 68%). Seemingly, women in these countries experience a female penalty. With the exception of Greece, the number of hours worked by women as whole is low. Even though mothers participate in the market at similar rates to women as a whole, there are likely barriers to employment given low levels of female employment.

In Australia, Canada, France, the United Kingdom, and the United States, employment is associated with a young child penalty. Employment rates for both mothers and women as a whole are moderately high (both are one point above the cross-country average), but there is a sizeable drop in the employment rates of mothers with young children. On average, mothers work more than their counterparts in other countries, but again there is sizeable drop in the hours worked by mothers with young children in three of the five countries. Seemingly, there is a penalty when children are young but rates rebound as children age.

How well do childcare configurations correspond to the type of penalty that employed mothers face? Figure 3 reproduces the four-fold table introduced above, but now maps the countries in each penalty group to the childcare configuration where the group fits best. Each

country is classified as having either above or below average availability of childcare in the public and private markets (compared to the cross-country average) and above or below average costs of childcare. The three criteria of public care, private care, and cost of care are then used to score the availability and affordability of the childcare market in each group. This serves two purposes. First, it shows employment patterns and the care classification scheme map well to one another. Second, it shows that women in countries with deeper childcare markets face fewer penalties when combining work and family.

Figure 3. Child Penalty Ideal Types

		Is Care Available? (positive/negative sign indicates above/below cross-country average)	
		No	Yes
Is Care Affordable?	Yes	*Female Penalty:* Greece: Public -, Private -, Cost - Ireland: Public -, Private -, Cost + Italy: Public +, Private -, Cost - Netherlands: Public -, Private -, Cost - Spain: Public -, Private -, Cost - *Affordability Score: 80%* *Availability Score: 10%*	*No Penalty:* Belgium: Public +, Private +, Cost - Denmark: Public +, Private +, Cost - Norway: Public +, Private +, Cost - Sweden: Public +, Private +, Cost - *Affordability Score: 100%* *Availability Score: 100%*
	No	*Traditional Penalty:* Austria: Public -, Private -, Cost + Finland*: Public +, Private +, Cost - Germany: Public -, Private -, Cost - Switzerland: Public -, Private +, Cost + *Affordability Score: 50%* *Availability Score: 38%*	*Young Child Penalty:* Australia: Public -, Private -, Cost - Canada: Public -, Private +, Cost + France*: Public +, Private +, Cost - United Kingdom: Public +, Private +, Cost + United States: Public -, Private +, Cost + *Affordability Score: 40%* *Availability Score: 60%*

*Outlier in classification scheme
Sources: OECD Social Expenditure Database; OECD Family Database; Gullett (2005)

The four countries with no penalty fit squarely in the quadrant describing care as both affordable (4 of 4 countries have below average costs, so scoring 100%) and available (4 of 4 countries have above average availability over 2 criteria, so scoring 100%). The four countries in the traditional penalty group fit in the opposing quadrant, where care is neither affordable (50%)

nor available (38%). The five countries in the female penalty can be described as having affordable care options (80%) but supply does not meet demand (10%). The last group, those countries with a penalty for mothers with young children, fit in the quadrant where care is at least somewhat available (60%) but not particularly affordable (40%).

In each case, patterns also emerge with respect to reliance on informal care in each of the groups. The no penalty group has below average levels of informal care. In countries where employed mothers experience a young child penalty, levels of informal care are high. Women in countries with a traditional penalty typically do not rely on formal care, but those with a female penalty do. Country-specific examples help illustrate these trends.

In Sweden and Denmark, two countries with no child penalty for employed mothers, children have a right to a spot at an early childhood education and care center from the age of one. This right has recently been introduced for the Norwegian kindergarten. Denmark is one of the few countries to have childcare services outside of school hours that are large enough to meet demand. And Belgium has been said to have "one of the most comprehensive early education and care systems in Europe" (OECD, 2006: 283). In the Scandinavian countries, some of the responsibility for the implementation of high-quality care services has been devolved to municipalities, who outsource care to private providers. In other words, childcare policies encourage both public and private provision of childcare services. In these countries, the informal market is unnecessary.

Finland and France stand out has having childcare configurations similar to Belgium and the Scandinavian countries, but employment patterns mirroring a traditional and young child penalty, respectively. A policy-relevant explanation exists. Childcare is considered a universal right in Finland as in the other Nordic countries, but in practice enrollment is lower (OECD,

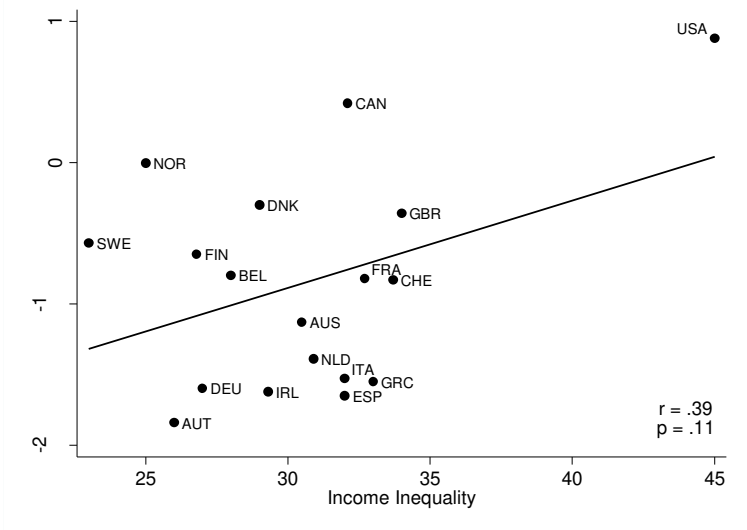
2006). While each of the Nordic countries has a child home care allowance, it is more fully established in Finland. The child home care allowance, which can be used as a wage replacement if mothers exit the market, is generous in Finland. Mothers utilize the program at a high rate (Ellingsæter, 2012). France, too, offers a monthly parental allowance if one or both parents reduce working hours to care for a young child. Generous policies can lead to a "penalty" when they are designed to reduce employment. This is apparent in Austria and Germany also, where Christian Democratic parties actively pursue policies that discourage maternal employment (Leitner, 2010).

Mothers who wish to work in Southern Europe, Ireland, and the Netherlands face dilemmas because care is largely unavailable. Some mothers turn to informal care, some find care in the small public and private markets, and some remain outside of the labor market. In other words, mothers living in these countries experience the greatest challenge when trying to acquire care for their children. They also face a different set of cultural and economic circumstances. Greece aside, these are countries with a strong Catholic history. With the exception of the Netherlands (and maybe Ireland) they have weaker economies compared to the rest of Europe. Indeed, these countries may have weaker economies in part because female labor force participation is low.

Canada, the United Kingdom, and the United States likely have higher levels of private care because of the structure of the labor market: high levels of income inequality prompt families who are more financial secure to outsource care to families who are less financially secure. Low wages in the childcare market relative to wages elsewhere encourage maternal employment as a whole. Figure 4 plots this relationship. Income inequality, as measured by the Gini coefficient, varies widely across countries. The Anglo countries have some of the highest

levels of inequality and also some of the highest levels of private care provision, substantiating the argument made in Morgan (2005). The relationship is weakened by the Scandinavian countries, which are perhaps the exception that prove the rule with generous subsidies used to prop up private childcare markets.

Figure 4. Income Inequality and Private Childcare



Source: Gullett (2005); OECD Income Distribution Database

Child Penalties at the Individual-level

Connections exist between maternal employment and childcare at the macro level. Those countries with smaller child penalties have either high governmental spending on childcare, high levels of private childcare, or both. Table 3 provides the results linking childcare to micro-level employment outcomes in four quantitative models. Independent variables include five variables measured at the individual level (parental status, whether a young child is present in the household, age, education, and income) and four variables measured at the country level representing public care, private care, informal care, and cost of care. Interactions are included to determine the ways in which childcare arrangements affect mothers. Models 1 and 2 employ logistic regression and include all women in the sample. A binary variable indicates work status,

and odds ratios are reported. Models 3 and 4 use OLS regression. The dependent variable indicates the usual number of hours worked per week, including all workers in the sample.

Table 3. Logistic and OLS Regression Results

	(1) Engagement[a]	(2) Engagement[a]	(3) Intensity[b]	(4) Intensity[b]
Motherhood	0.592***	0.370***	-5.122***	-0.359
	(0.00)	(0.00)	(0.00)	(0.86)
Young child in household	0.490***	0.481***	-1.656***	-1.570***
	(0.00)	(0.00)	(0.00)	(0.00)
Public childcare	1.779***	0.867	-2.077	-2.234
	(0.01)	(0.55)	(0.28)	(0.26)
Private childcare	1.133**	0.974	2.858***	1.071*
	(0.03)	(0.80)	(0.00)	(0.08)
Cost of childcare	0.999	0.999	-0.115***	0.007
	(0.88)	(0.91)	(0.00)	(0.87)
Informal childcare	0.986***	0.986***	-0.066	-0.070
	(0.01)	(0.01)	(0.48)	(0.46)
Age	0.990**	0.989***	-0.087***	-0.075***
	(0.03)	(0.01)	(0.00)	(0.00)
Education	1.425***	1.431***	0.307	0.298
	(0.00)	(0.00)	(0.37)	(0.37)
Household income	1.291***	1.289***	0.594***	0.577***
	(0.00)	(0.00)	(0.00)	(0.00)
Mom*public childcare		2.446***		
		(0.00)		
Mom*private childcare		1.197*		2.393***
		(0.06)		(0.00)
Mom*cost of care				-0.169**
				(0.03)
Constant			43.833***	40.137***
			(0.00)	(0.00)
Observations	88683	88683	36789	36789
R-squared			0.107	0.114

Robust p values in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

[a] Logistic regression clustered over 18 countries, odds ratios reported
[b] OLS regression clustered over 14 countries. Employment intensity data not available for Denmark, Finland, Norway, and Sweden.
Sources: Luxembourg Income Study; OECD Social Expenditure Database; OECD Family Database; Gullett (2005)

As indicated in the descriptive statistics, mothers enter the labor market at lower rates. Model 1 more precisely estimates this effect for the pooled-country sample. The likelihood that a mother is in the market is 60% of the likelihood of the total sample. Having a young child present in the household lowers employment further – mothers with young children are only half

as likely to be in the workforce. For those mothers who remain in the market, the presence of children lowers the intensity of labor market attachment (Model 3). Holding all else constant, mothers are expected to work five fewer hours per week than their childless counterparts. Mothers with young children are expected to work about two fewer hours per week.

In Model 1, three of the four childcare variables (measuring public care, private care, and informal care) influence participation in the labor market. An increase in spending on childcare services by .25% of GDP is associated with an increase in the probability of employment of around a fifth. A 2% increase in the level of private childcare is associated with an increase in the probability of employment of about the same magnitude – around a fifth. Women in a country with higher levels of informal childcare are slightly less likely to be employed (1% less likely for every 1% increase in the level of informal care). The cost of care does not have an independent effect on the likelihood of employment.

Two of the four childcare variables influence intensity of employment (Model 3). A one percent increase in level of private care increases the expected number of hours worked by three hours per week. An increase in the out-of-pocket childcare costs representing 10% of the average wage decreases the expected number of hours by one hour a week. Government spending on childcare and the level of informal care do not have an independent effect on the number of hours that women work. Models 1 and 3 show the effect of childcare configurations on female employment while holding all else constant, but do not indicate the effect that childcare has on mothers in particular. Models 2 and 4 include interactions to consider whether childcare influences mothers more than those who are childless. A significant interaction term indicates this is the case.

Two interaction terms are incorporated into Model 2, one between motherhood and public childcare, and one between motherhood and private childcare. In both cases, the interaction term is significant and trends in a positive direction. The positive effect of childcare is more pronounced for mothers than for those who are not mothers. The inclusion of the interaction terms in the model lead to a loss of significance for the non-interacted public and private childcare terms; childcare configurations do not have an independent effect on the employment of women after taking into account the effect that these configurations have on mothers. Being a mother retains its significance as having an independent effect on employment status, as would be expected given that childcare is unlikely to be the only factor that mothers consider when making employment decisions.

Two interaction terms are also incorporated into Model 4, between motherhood and private childcare and between motherhood and cost of care. Both are significant. The level of private childcare increases the expected number of working hours for mothers. Increases in the out-of-pocket costs of childcare lower the expected number of working hours of mothers, but do not influence the expected number of those who are childless. Relevant from a policy perspective, the variable for parental status is not significant when interactions are included, indicating that being a mother does not have an independent effect on the number of hours worked after accounting for childcare configurations. Having a young child, however, still has an independent and negative effect on employment intensity.

Taken together, the models provide a surprisingly clear picture: a number of childcare configurations are important predictors in employment patterns. As expected, they influence maternal employment, but not the employment patterns of childless women. The variable

representing private childcare is similar in magnitude as the variable representing public childcare. Does this mean that private childcare acts as a substitute to public care?

Predicted probabilities, listed in Table 4, can be used to determine whether a substitution effect exists. A woman with set characteristics (a mother aged 30 with a medium education level, a household income in the 5th decile, either with or without young children) is "placed" in four different scenarios, each representing a hypothetically different childcare market. In the first scenario, the mother experiences a childcare system where very little is spent on childcare (the lowest value in the sample, which corresponds with Greece) and private childcare markets are very small (the lowest value from the Austrian system). In the second scenario, the amount spent on childcare is held constant at the minimum value, but the level of private childcare is high (using the maximum value from the United States). In the third scenario, predicted values are calculated in the opposite manner, with high spending (Denmark) but little private care. In the final scenario, both spending and private levels of care are high. In each of the four scenarios, cost of care and levels of informal care are set to their mean values.

Table 4. Predicted Probabilities of Employment, Select Childcare Configurations

	Child < 3	Child ≥ 3
Min Public / Min Private	46%	63%
Min Public / Max Private	54%	71%
Max Public / Min Private	61%	76%
Max Public / Max Private	68%	81%

Source: See Table 3

The probabilities indicate that private childcare does not act as a full substitute to public care, but it does have a sizeable supplemental effect. The presence of both types of care markets corresponds with the highest predicted employment rate; for instance mothers with a young child have a 68% probability of working. In markets with high levels of public care but low private care, mothers have a 61% probability of working, and a 54% probability in the opposite case.

When both levels are low, mothers only have a 46% probability. The range of predicted values is four points wider for mothers with young children, as a comparison to mothers with older children. Young children are more expensive to care for, and younger mothers will have lower wages on average since they are earlier in their careers. From a policy perspective, it points to the importance of creating policies that specifically target mothers with young children.

Conclusions

The analyses in this paper show that including measures of the private childcare market provides analytic traction in understanding maternal employment patterns. In looking at care in both the public and private markets, this paper has focused on mechanisms rather than policy tools. It has shown that availability and affordability of childcare in multiple care markets combine to correlate with maternal employment rates at both the country and individual level.

Moving forward, the collection of better data is arguable one of the most important steps to further assess how care markets influence employment. Data on childcare markets are less common and not as complete as data on employment. For instance, countries in the rich OECD carefully collect data on a number of different employment behaviors, and organizations like LIS make these data available in harmonized form. However comparable cross-country data on childcare markets are very broad, and collected infrequently. Ideal measures of the childcare market will hinge on two components: the availability and the affordability of care in the public, private, and informal care markets.

Childcare can be measured at a policy level or an individual and household level. The first form – like the data used in this paper – hinges on institutional data. It enables a close look at policies, regulations, and enrollment. But central recording of data may be limited or

inaccurate in countries where care is provided in the private sector, or in federal systems where care is often financed and regulated locally. Additionally, data on costs of care will typically be simulated given a set of tax and benefit policies, and provided only for some subgroups of interest. Any data collected at the institutional level is likely to be relatively broad.

Survey data can provide the missing nuance that institutional data lacks. Data on enrollment in care, the costs that families incur, and the reliance on different types of care are all directly collectable. Rather than simulating costs for one or two subgroups, actual costs could be calculated for any number of subgroups. But what microdata gains in nuance, it loses in feasibility and comparability. Comparative cross-country surveys are prohibitively expensive and time-consuming for all but the biggest of organizations. And even when countries agree to conduct surveys under a common framework, with similarly-agreed upon concepts and definitions (e.g. the EU-SILC survey), it does not guarantee comparability. Cross-country harmonization is difficult, and as Keck and Saraceno (2011) point out, small classification differences can have big consequences on analysis.

Given the potential challenges inherent in both forms of data, researcher should adopt a diverse set of strategies. A well-documented database of policy inputs and childcare outputs is essential. Once a more complete measure of childcare is created, the role of childcare can be more fruitfully examined vis-à-vis other policies like parental leave that also influence maternal employment. As a dependent variable, maternal employment is just one of many measures, which also include gender wage gaps, occupational differences, poverty rates, and preferences for hours spent at work and with children.

The availability and affordability of childcare undoubtedly influences maternal employment, but most research focuses on the availably and affordability of publicly provided

childcare. A more complete picture includes private care. This article has disaggregated the otherwise opaque group of countries in which mothers experience an employment penalty. Countries can be classified into one of four ideal types based on the existence and type of child penalty that employed mothers face. Empirical evidence supports the existence of such groups, and the effect of private childcare provision on maternal employment is of similar magnitude as spending on the direct provision of care. Private childcare is one key piece in a larger constellation of childcare policies and configurations that can reduce employment inequalities.

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