Occupation and the Political Economy of Trade: Job routineness, offshorability and protectionist sentiment

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Abstract

The movement of jobs overseas, known as offshoring, is an increasingly salient concern for many individuals, as technological innovations and expanding global production have increased the number and type of jobs that can be performed abroad, especially in services. Fragmented production has transformed the competitive pressures from trade, which now occur at the level of individual jobs, rather than the sector or firm level. As a result, occupation characteristics are a key determinant of how trade affects workers, and thus individuals' trade preferences. We argue the welfare consequences of trade are determined by (1) whether an individual's job tasks can be provided from a distance, i.e. its offshorability, and (2) whether jobs tasks are competitive internationally. We find support for our theory using data from the 2003 and 2013 International Social Survey Programme modules for high-income democracies. Our results suggest that occupational characteristics are important determinants of trade preferences.

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1 Introduction

The movement of jobs overseas, known as offshoring, has increased dramatically in the last few decades, as falling communication and transportation costs have expanded the number and type of jobs that can be provided from abroad. Although offshoring in manufacturing is not new, offshoring in the 1990s and 2000s has included more skill intensive tasks from a broader range of industries, including information and services. Compared to manufacturing, offshoring in services has the potential to expose large segments of the labor force to international trade competition for the first time, especially in developed countries where the share of the labor force employed in service activities (previously considered non-tradable) is significantly larger than the share employed in manufacturing.[1] One estimate from the U.S. suggests 29 percent of jobs are vulnerable to offshoring (Blinder, 2007). (See also Jensen and Kletzer, 2005; Jensen, 2011). Additionally, these newly offshorable jobs have tended to be high wage, white collar jobs. It is therefore unsurprising that offshoring is both unpopular (Mansfield and Mutz, 2013) and controversial in the public press and political arenas in developed countries (for the U.S. see Mankiw and Swagel, 2006). Moreover, offshoring is politically salient to voters as suggested by Margalit's (2011) finding that trade related job loss, especially offshoring, generates electoral costs in U.S. presidential elections.

Although some economists like Greg Mankiw (in the "Economic Report of the President," 2004) and Jagdish Bhagwati (2009) have argued in favor of offshoring due to expected efficiency gains, others like Baldwin (2006) and Blinder (2007; 2009) suggest offshoring is akin to a new industrial revolution, transforming global production and its consequences for workers. This shift from thinking about 'trade in final goods and services' to 'trade in tasks' is not simple semantics, but a shift with important implications for individual workers in the economy, as competitive pressures shift to the job level. In particular, fragmented production means that individuals economic well-being is more closely tied to their occupation (the type of work they do) rather than the industry in which they do it. More so than

[1] In 2007, 10 percent of US workers were employed in manufacturing, while 25 percent are employed in tradable business services (Jensen, 2011).

industry or firm, individuals identify with their occupation, and the costs associated with changing occupations are significantly higher than costs associated with changing sectors (e.g Kambourov and Manovskii, 2009). As we discuss further, the primary models of distributional consequences used in the international political economy (IPE) literature, which predict that reallocation from trade will occur across sectors, cannot account for distributive pressures at the individual level, in which individuals with the same level of skill, in the same industry or firm, may be differentially affected by trade due to differences in how likely it is that job tasks can be provided from abroad. An important exception is Chase (2008), who draws attention to this fundamental shift in production and is one of the first to recognize the role of occupations in shaping trade cleavages between workers within industry.

Building on the trade in tasks literature from economics (especially Acemoglu and Autor, 2011), we propose a model in which the winners and losers of globalization are determined by occupation characteristics. Specifically, the welfare consequences of trade depend upon the degree to which job tasks can be provided from abroad, in combination with the degree to which those tasks are competitive internationally. The offshorability of a task depends on whether it is location-dependent and how much face-to-face interaction the task requires.[2] Task-based comparative advantage, on the other hand, depends on whether the task utilizes relatively abundant or scarce factors intensively. Thus, whereas offshorability represents the ability of a task to be offshored, task comparative advantage or disadvantage determines which tasks are likely to be imported (through offshoring) or exported (through onshoring). In particular, trade is likely to increase the provision of offshorable tasks of comparative disadvantage by foreign labor. We argue that task comparative advantage is determined by the routine versus creative content of tasks. In developed countries, which have a comparative disadvantage in non-routine tasks, individuals in occupations intensive in offshorable, routine tasks will be more likely to experience negative welfare outcomes as a result of trade liberalization.

[2]Two recent studies in political science examine how vulnerability to offshoring affects preferences over outsourcing (Mansfield and Mutz, 2013) and perceptions of job insecurity and policy preferences (Walter, 2014).

Our theory predicts that in developed countries, individuals in routine occupations will be more protectionist than those in non-routine occupations and this effect will be greater for individuals in more offshorable occupations. We primarily use survey data for 22 developed countries from the 2003 International Social Survey Programme (ISSP) National Identity survey to test our hypotheses. We supplement our analysis with a smaller, newly released, sample of developed countries included in the 2013 ISSP National Identity survey. Our dependent variable is a measure of protectionist sentiment, and we use measures of routineness and offshorability developed by Acemoglu and Autor (2011) as the primary measures of our independent variables. We find evidence to support our theoretical prediction that preferences over trade are a function of task-based comparative advantage and offshorability, even after controlling for other factors suggested by the existing literature. In particular, those in routine task-intensive occupations are more protectionist than those in less routine occupations, and this effect is increasing in occupational vulnerability to offshoring.

Adding to a vast literature in IPE that examines the determinants of individual preferences over trade (for review see Kuo and Naoi, 2015), our theory offers a new account of the welfare consequences of trade. It explains patterns of protectionist sentiment that cannot be accounted for by the existing literature, which emphasizes factor ownership and industry. In contrast, our theory predicts that competition occurs at the task level, and that occupation characteristics are an important determinant of the distributional consequences of trade for workers, and thus are likely to shape trade preferences. Our findings have important implications for the study of trade policy outcomes because they suggest a new source of preferences for labor. Trade is likely to create cleavages along occupation lines, and therefore elected officials should consider the routineness and offshorability of their constituents.

2 An Overview of the Trade in Tasks Model

To understand the labor market implications of the ever deepening division of labor in international production for workers, we turn to the literature on the trade in tasks (e.g. Acemoglu and Autor, 2011; Grossman and Rossi-Hansberg, 2008). Grossman and Rossi-Hansberg (2008) suggest that "[f]or centuries, trade mostly entailed an exchange of goods.

Now it increasingly involves bits of value being added in many different locations, or what might be called trade in tasks" (1978). Technological innovation means that it is now possible to separate production processes in time (i.e. produced non-simultaneously) and space (e.g. different locations) within industries, which enables increasing levels of trade in intermediate goods and services. In the tasks framework, tasks are combined to produce goods and services. The ability to 'unbundle' the production of these outputs means that competiton from trade no longer occurs at the industry or firm level, but at the individual level (e.g. Baldwin, 2006).

To explain how trade in tasks differs from the trade in final goods emphasized by the canonical models, it is necessary to distinguish between tasks, factors of production and goods. Tasks transform inputs (i.e. factors of production) into outputs. Put differently, each task defines a unit of work that is done by an input (e.g. lifting, typing, dissecting, editing, etc.) leading to the production of an output (e.g. a burger, microchip, medical operation, etc.).[3] The production of goods and services consists of the combination of a number of tasks where more complex goods and services require more tasks. Factors of production (e.g. workers of different skill levels and capital) are the inputs used to accomplish tasks, and produce outputs.[4]

Workers, who perform tasks in exchange for wages, are endowed with different skill-levels, which determines their capacity for performing a particular task.[5] In contrast to canonical models where factors are equivalent to tasks, trade in tasks models allow the set

[3]Note that not all tasks require labor input (e.g. mechanization).

[4]While 'land' is also considered a traditional factor of production, we follow the trade-in-tasks literature and focus on labor and capital.

[5]These skills are exogenously given or acquired through education or other investments. Given our interest in explaining preferences over trade, we focus labor inputs to tasks. In doing so, we follow the model of Acemoglu and Autor (2011) which assumes that the cost of capital is constant across different goods and independent from the costs of labor. See Grossman and Rossi-Hansberg (2008) for an alternative model of trade in tasks.

of tasks performed by each factor to shift in response to market forces including trade and offshoring, such that the lowest cost factor performs a given task in equilibrium (Acemoglu and Autor, 2011; Autor, 2013). The task-based framework allows for the possibility that workers with the same skill level can perform different types of tasks (e.g. a medium skill worker can perform either, low, medium or even high skill tasks), though labor productivity will differ across tasks. Given a fixed supply of low, medium, and high skill workers, high skill workers are more productive than medium and low skill workers at providing more complex tasks (and medium skill workers are more productive than low skill workers). Thus workers are allocated to a particular tasks on the basis of comparative advantage.[6] Thus the same firm may use different production strategies in different countries, employing labor-intensive production methods in low wage countries where labor is comparatively cheap and more capital-intensive methods like robotics in high wage countries. (Autor, 2013).

In a perfectly competitive labor market with full employment, all workers of the same skill earn the same wage even if they perform different tasks. As a result, there is a subset of tasks performed by low skill workers, another set performed by medium skill workers, and finally a set performed by high skill workers.[7] Shocks like technological innovation and trade liberalization lead to the reallocation of skills to tasks.[8] However, in contrast to factoral and

[6]An input has a comparative advantage in providing a specific task if it can do so at the lowest economic cost, which is a function of the technological capability of an input to perform a task and opportunity cost of using the input to perform a specific task instead of another.

[7]See Acemoglu and Autor (2011) for a general equilibrium model with this endogenous allocation of skills to tasks.

[8]Technological innovation like the rise of information technology changes the economic cost of using different inputs to perform specific tasks. See for instance, Acemoglu and Autor (2011) who argue that modern advances in communication and information technology have impacted routine tasks, making middle-skill workers vulnerable to both replacement by machines/computers and to offshoring, and indirectly putting downward pressure on wages

sectoral models, which predict reallocation between industries or firms, this reallocation of workers to tasks occurs at the individual level.

3 A Theory of Occupation-based Distributional Cleavages

Relaxing the assumption of full labor mobility has important implications for the nature of distributional consequences in the tasks framework, as suggested by Hiscox's (2002) theory of mobility and sectoral versus factoral cleavages. Limited labor market mobility may result from any number of labor market frictions, including lack of qualifications to perform certain tasks or unobserved heterogeneity (e.g. worker productivity).[9] We argue that limited labor market mobility will lead to distributional cleavages along occupation lines. Occupations can be thought of as bundles of tasks.[10] When it is difficult for labor to switch occupations, for instance, due to licensing and degree requirements that prevent individuals from freely moving from one occupation to another, occupations will determine who benefits from trade.[11] In this section, we provide an occupation-based model of the distributional consequences of trade. We argue that the distributional consequences of trade in tasks for workers depend on (1) whether their occupation is intensive in routine tasks and (2) whether the occupation is intensive in tasks which can be traded.

of low skilled workers who face increased competition for their jobs from excess medium skill workers.

[9]For recent models of labor market frictions, see Egger and Kreickemeier (2009), Davis and Harrigan (2011) and Helpman and Itskhoki (2010).

[10]A surgeon, for example, performs multiple tasks during an operation, from using a scalpel to make incisions to lifting a body onto the operating table.

[11]Not only are occupation characteristics are a primary determinant of wage outcomes (Ebenstein, Harrison, McMillan and Phillips, 2014; Acemoglu and Autor, 2011), but there are large costs associated with switching occupations and these costs are significantly larger than those associated with switching industries (Kambourov and Manovskii, 2009).

3.1 Task Routineness and the Competitiveness of Occupations

Recall that tasks are performed by workers with the lowest opportunity cost of doing so. When trade liberalization occurs, a country will begin to import tasks that can be provided relatively more cheaply abroad. Thus countries will have a comparative advantage in providing tasks that use the relatively abundant factors intensively (due to a lower opportunity cost). Developed countries, which are abundant in high skill labor, will have a comparative advantage in tasks that are more efficiently performed by high skill workers. Countries like India and China, which are more labor abundant, have a comparative advantage in tasks that utilize low to medium skill workers. Thus a country is likely to supply (export) tasks intensive in the use of relatively abundant factors, and purchase (import) tasks from abroad that use the relatively scarce factor intensively.

By shifting our thinking about comparative advantage from a particular good or service to comparative advantage in a particular task, we are able to capture the notion that different countries can each contribute to the production of a good or service (Grossman and Rossi-Hansberg, 2008) and that this creates competition at the level of the individual, rather than industry or firm. If, for example, tasks performed by medium skill workers can be executed by *lower-paid* medium skill workers in a foreign economy after trade liberalization, demand for domestic workers of medium skill will decrease and those workers will need to reallocate their skills to other, often lower skill tasks (assuming medium skill workers are better substitutes for low skill workers than high skill workers).

In order to identify task-based comparative advantage, we must determine the characteristics of tasks that are likely to be filled by less skilled workers and those that require more skilled workers. To do so, we follow an emerging literature in economics which suggests that the *routine* content and the *creative* content of tasks are key features distinguishing occupations and thus labor market outcomes (e.g. Acemoglu and Autor, 2011; Autor, Levy and Murnane, 2003; Crino, 2010; Ebenstein et al., 2014). In their seminal work on this topic, Autor, Levy and Murnane (2003), develop a two dimensional classification of tasks: (1) cognitive or manual; and (2) routine or non-routine (abstract). First, manual tasks are those that require substantial physical work, while cognitive tasks, as the name suggests,

involve mental work. On the second dimension, routine tasks are those which follow a script or set of rule-based procedures. Routine manual tasks are primarily production activities (e.g. assembly of a manufactured good), while routine cognitive tasks often involve sales, and clerical and administrative support (e.g. data transcription or record-keeping). Non-routine manual tasks include things like truck driving or food preparation, while non-routine cognitive tasks are often associated with professional and technical occupations (e.g. management of staff, practice of medicine).

Task routineness, a job characteristic, is not simply a proxy for skill, which is an endowment of the individual. The relationship between routineness and skill level is non-monotonic. Non-routine manual tasks tend to be low-skill, while non-routine cognitive tasks tend to be high skill.[12] Non-routine cognitive tasks require creative thinking and are difficult to mechanize (i.e. these tasks are more likely to be performed by high-skilled labor). Routine manual and cognitive tasks tend to be filled by medium skill workers (including manufacturing workers and those in white-collar office jobs). Because routine tasks require less spontaneity and more repetition, these tasks can be more readily taught to foreign workers in countries that are more labor abundant, and those workers can perform the tasks for lower wages.

Thus, developed countries have a comparative advantage in non-routine cognitive tasks and a comparative disadvantage in routine tasks. Therefore, individuals in occupations that are routine task-intensive are less competitive internationally and thus more likely to be hurt by international trade. This is true of both services (routine cognitive) and manufacturing (routine manual). On the other hand, those individuals in occupations that are intensive in non-routine, cognitive tasks are likely to be competitive internationally, and thus likely to benefit from international trade. The welfare implications for individuals in occupations intensive in non-routine, manual tasks are less straightforward because, as we discuss in the next section, it is less likely that these tasks can be provided from abroad. Therefore, the consequences of trade for workers in these occupations are indirect, and based on competition

[12]Indeed, the concept of routineness helps explain polarization of the labor market in developed countries like the U.S., which have seen increasing demand for low- and high-skill workers, and decreasing demand for middle skill workers (e.g Acemoglu and Autor, 2011).

from the excess supply of labor in other tradable occupations, plus consumption effects.

3.2 Tradable Tasks and Offshorable Occupations

Up to this point, we have focused on the characteristics of tasks that determine competitiveness, but have said nothing about which tasks can feasibly be traded. This leads to the second key factor that determines labor market outcomes: the degree to which an individual's occupation is intensive in tasks that can be provided from abroad. Not all bundles of tasks are easily provided from abroad: some tasks depend on a specific location (e.g. farming, park rangers) or require face-to-face interaction (e.g. hair stylists, management), and are thus more difficult to relocate. On the other hand, many manufacturing tasks (e.g. assembly of clothing) and services tasks (e.g. customer service) can be transported physically or over a wire. Blinder (2007) suggests that offshorable tasks are those that do not have to be performed at a specific location and do not require face-to-face interaction.[13]

Here we use offshorable to mean that a particular task can be provided from abroad. Though offshorability has a negative connotation (e.g. Blinder, 2006), we use offshorability more generally to mean tradable. Much of the existing work conflates whether a task can *possibly* be provided from a remote location with characteristics of the task that shape whether it is *likely* to be offshored. However, this conflation overlooks the difference between the ability to offshore a job, and the benefit to doing so.[14] For our purposes, offshorability explains only whether a task can be provided from abroad and therefore captures the possibility of tasks being imported, but also of tasks being exported (offshoring and onshoring, respectively), but it does not address the likelihood that a job will be offshored.

[13]Jensen and Kletzer (2005) develop an alternative measure of offshorability based on geographic concentration of the delivery of services in the United States.

[14]For example, Crino (2010) emphasizes "three characteristics that contribute to making an occupation tradable. First, the job should be routine; second, it should produce impersonal services; and third, it should be ICT-enabled" (601). Walter (2014) is an important exception. As we will discuss, some non-routine jobs can be offshored.

3.3 Occupational Determinants of the Winners and Losers from Trade

The winners and losers from trade among workers will be determined by the degree to which individuals' occupations are routine- and offshorable-task intensive. Thus, all things equal, the offshorability of one's occupation alone does not determine whether an individual stands to gain or lose from trade. Workers from a scarce (an abundant) factor of production in highly offshorable jobs will stand to lose (gain) more from trade liberalization. More formally, the expected impact of trade for an individual is equivalent to the offshorability of occupation tasks (face-to-face and location dependence) $\times$ the comparative advantage of occupation tasks (routine content of tasks).[15]

In developed countries, which are less competitive in routine tasks, trade is likely to harm individuals in occupations intensive in routine and offshorable tasks. Innovations in communication and information technologies can exacerbate this, making key tasks performed by middle skill workers more offshorable. For workers in uncompetitive, offshorable jobs, trade liberalization exerts downward pressure on wages, even if jobs are not actually offshored. Economists find evidence in support of this claim; individuals in offshorable, non-competitive occupations experience negative welfare consequences, in terms of wages, job security and employment outcomes. See for instance, Ebenstein et al. (2014), who find no evidence that industry exposure to globalization affects wages in a study of U.S. workers in the Current Population Survey from 1948 to 2002. Instead, they find large negative wage effects for occupational exposure to globalization, especially for routine production workers, and moreover, that this effect is increasing over time. Crino's (2010) findings suggest that high skill jobs have positive elasticities of demand and low skill jobs have negative ones, and within skill level, those that are more tradable have greater negative elasticities of demand, and are more likely to be offshored.

[15]Note that technological innovation has made offshoring of more jobs possible, but has also impacted routine workers, who are not only vulnerable to competition from foreign labor, but also to automatization. The interaction allows us to examine both channels through which technology can impact the welfare of workers.

It is important to note that offshoring does not actually need to occur in order for workers in offshorable occupations to realize these negative distributional consequences. The threat of offshoring in and of itself can create these pressures (Blinder, 2007). Indeed, just looking at the number of jobs offshored likely understates the true impact of the phenomenon, because we can never know how many jobs would have been created in the domestic economy if not for offshoring (Garner, 2004). Thus it is important to distinguish offshorability, the job characteristic, from offshoring, which is the action of jobs being offshored. But for those individuals whose jobs are offshored, the wage effects are even more dramatic and can entail significant adjustment costs associated with finding a new job. Indeed, Blinder (2009) suggests the disruption and transition costs associated with increasing offshoring are extremely large in magnitude, with the potential for lasting, involuntary unemployment.

In developed countries, those individuals in occupations intensive in non-routine, offshorable tasks may benefit from trade through the *onshoring* of tasks. This includes services that rely heavily on knowledge or creativity, including things like research and development and design. For example, the technical aspects of computer programming (writing, testing software) may be offshored, while the services of computer systems designers (development of software) may be onshored.[16] The outcome for individuals in occupations intensive in non-offshorable tasks is less straightforward. Developed countries are scarce in low-skilled labor, but many low-skill occupations are not directly threatened by trade because the tasks associated with them are not offshorable (e.g. food service). Members of the scarce labor factor, whose occupation is difficult to shift abroad, may be more insulated from the wage effects of trade competition than those, of similar or even higher skill, whose occupation is either less location-dependent or requires less face-to-face interaction. However, there may be negative wage effects for low skill workers if the excess supply of medium skill workers

[16]Computer programming (ISCO-88 code 2132), which involves writing and maintaining computer programs, has a task routineness score of 1.35 (measure explained below). This is in contrast to, for instance, computer systems designers and analysts (ISCO-88 code 2131), who "conduct research, improve or develop computing concepts and operational methods, and advise on or engage in their practical application" and have a routineness score of -.06.

begins to compete for the same tasks.[17]

4 Occupation-based Preferences over Trade

In our theory, trade preferences are determined by the welfare consequences of trade for workers, which we generally refer to as wage effects (while acknowledging additional labor market consequences like increased job insecurity). If someone's wage increases as a result of trade liberalization, we expect that person will be more in favor of policies that further open markets to international trade; if wages decrease, the individual will be opposed, while individuals unaffected by trade will be neutral. Our theory of distributional preferences suggests that the occupation characteristics of routeiness and offshorability will shape attitudes toward trade liberalization. In developed countries, occupations intensive in routine tasks may be particularly vulnerable to wage losses, and thus prone to protectionist trade sentiment, especially among those most vulnerable to offshoring. Crucially, existing models, which emphasize skill and industry, are unable to explain variation in protectionist sentiment along occupation lines.

In Table 1, we summarize our expectations about preferences over trade with a simple two-by-two schema to categorize occupations. On the first dimension we have offshorability. By thinking about trade competition in terms of trade in tasks, the concept of offshorability recognizes that new segments of the labor force, namely those in services, are exposed to trade. On the second dimension, we suggest that competitiveness is determined by whether occupations are intensive in routine or non-routine tasks. In the upper left corner, individuals in highly offshorable, routine occupations are more likely to support trade protection. This includes manufacturing workers (production), as well as routine cognitive workers, such as software writers or data entry technicians. In the upper right, those in highly offshorable,

[17] While it may seem that medium-skilled workers will disperse, with equal probability, into occupations that rely on high-skilled versus those on low-skilled tasks, economists argue that this is not the case; that medium skilled workers will be much more likely to disperse into occupations that rely on lower skilled tasks, putting wage pressure on lower-skilled workers.

non-routine occupations are likely to support trade liberalization. These individuals likely perform non-routine cognitive tasks, and include consultants and researchers, for instance. They are likely to benefit from trade. In the bottom row, we have individuals in low offshorability occupations; thus they are not directly exposed to trade competition. However, they may indirectly be hurt by (benefit from) trade if trade reduces (increases) demand for workers of that skill level. In other words, individuals in non-offshorable, routine jobs may be hurt by trade due to increased competition for those jobs from individuals displaced by trade.[18] We defer to empirics as to whether individuals in non-offshorable occupations are indifferent to trade protection, or whether their preferences align with their task-based comparative advantage regardless of direct exposure to trade.

Table 1: Support for trade by occupation characteristics (*in developed countries*)

	Routine	Non-routine
High offshorability	***Protectionist***	***Pro-trade***
	Machine operator	Consultant
	Bookkeeper	Researcher
	Software writer	Computer systems designer
Low offshorability	***Indifferent/Protectionist***	***Indifferent/Pro-trade***
	Mail clerk	Doctor
	Miner operator	Childcare worker

This leads to the following hypotheses:

HYPOTHESIS 1: Individuals with higher levels of task routineness are more likely to support trade protection.

[18]The intuition is that even workers in non-offshorable jobs (who do not experience job competition from the newly offshored) may experience positive benefits from trade, through reduced prices of goods. In support of pro-trade consumer effect in Latin America, see Baker (2005). Alternatively, Naoi and Kume (2011) find that individuals in developed countries are likely to support agricultural protection in contrast to their consumer interests when they are fearful of their own future job security. This benefits is available to all consumers and thus we do not expect it to bias our results.

HYPOTHESIS 2A: Individuals with higher levels of task routineness will be increasingly likely to support trade protection as offshorability increases.

HYPOTHESIS 2B: Individuals in offshorable occupations will be more likely to support protection as the level of occupation routineness increases.

We now briefly contrast the expectations of the occupation-based model, with those of the standard models used in political science: Heckscher-Ohlin (HO) and Ricardo-Viner (RV). According to HO, preferences over trade will be determined by individuals' factors. In developed countries this has meant that high-skill individuals will support trade openness and low-skill individuals will support protection. For instance, studies of individual preferences by Scheve and Slaughter (2001), Blonigen (2008), Mayda and Rodrik (2005) use education level as a proxy for skill-level and find support for the predictions of the HO model.[19] Under RV, trade preferences occur on the basis of industry, and individuals in exporting industries will support liberalization, while those in import-competing industries are likely to support protection. Support for this framework at the individual level has been mixed.[20]

First, recall that under HO, factors are fully mobile within the domestic economy and thus cleavages should occur along factor lines. In the case of labor interests, these cleavages emerge between individuals of different skill levels.[21] Under full mobility, the occupation-

[19]More recently, a debate has emerged in the literature over the role of education, particularly a college education, in shaping attitudes toward globalization, suggesting that education affects preferences for non-material reasons. See for instance Hainmueller and Hiscox (2006) and Margalit (2012).

[20]For support, see Blonigen (2008), Busch and Reinhardt (2000) and Mayda and Rodrik (2005), while others do not find any support for this argument (e.g. Mansfield and Mutz, 2009).

[21]The original HO model includes only land, labor and capital (as in Rogowski, 1989) but the intuition regarding skilled and unskilled labor as additional factor endowments can be found in work such Milner and Mukherjee (2009).

based model would produce similar expectations to the HO model in that distributional cleavages, and thus preferences are based on factors. If, however, as we argue, labor market friction leads to less than perfect labor market mobility, restricting the reallocation of one's factor from one occupation to another, then factors may be stuck in their occupations, leading to wage effects for the occupation (and not simply the type of factors one owns).[22] Thus the occupation-based model predicts cleavages will occur across occupations depending on task routineness and offshorability. One may question again whether routineness is simply a proxy for skill, but recall that skill (most often measured by educational attainment) is a characteristic of the worker, whereas task routineness and offshorability are characteristics of an occupation.

The occupation model also differs from RV in which owners of the same factor can have different trade preferences depending on whether they are in an industry of comparative advantage or disadvantage. Industries have different (over-lapping) combinations of occupations and most occupations do not belong to a unique industry. In other words, while some occupations may be limited to one or several industries, other occupations will cut across sectors, and some may belong to all sectors. Thus, in the RV model, a call-center representative working in the manufacturing sector, would simply care about their industry of employment, rather than the offshorability of their occupation. In the occupation-based model, they would be more likely to have similar attitudes to other call center representatives in other sectors, than, say, a manufacturing production worker. Thus, the political cleavages (over trade policy) predicted from these two trade models may be dramatically different, with one predicting demand for protection by sector and the other predicting demand for protection along occupation lines.[23]

[22]The assumptions of frictionless factor mobility lead HO to be viewed as applicable in the long-term (e.g. Mayer, 1974; Mussa, 1974). In contrast, the occupational model can be viewed as a short- to medium-term model.

[23]The nature of factor mobility is a fruitful area of further research that has important implications for when we should expect cleavages to follow the RV versus occupation model.

The explanatory power of the occupation model is best demonstrated by considering the following example of a computer programmer and an information technology (IT) project manager in the IT industry. According to the O*NET database, both computer programmers and IT project managers typically have a four year degree or greater. Under HO, both individuals should prefer trade liberalization because, as owners of the abundant factor, their wages should increase. Under RV, both individuals should have the same preference in favor of trade liberalization because they are in the same industry. Neither HO or RV can account for the fact that companies are able to offshore computer programming jobs to other countries, and thus it is the occupational model that can explain why a computer programmer should be more protectionist than a project manager due to greater offshorability and task routineness (and also more protectionist than a computer systems designer as in the example in the above section). More generally, the occupation-based model provides an explanation for why high skill individuals, in well-paying, 'white-collar' jobs may have an incentive to support trade protection.

5 Research Design

We use data from the 2003 and 2013 National Identity modules of the International Social Survey Programme (ISSP) to test our hypotheses that preferences over trade are a function of task routineness and offshorability. The ISSP, which codes occupations using the 4-digit Standard Occupation Classification (SOC), is one of the only surveys that asks about trade preferences and also provides detailed occupational data in the public sample. This disaggregated information about individuals' occupations is necessary in order to generate meaningful measures of occupational characteristics.[24] We limit the sample to high-income democracies because of our expectations about the relationship between task competitiveness

[24]For example, the public American National Election Study (ANES) provides occupation information at the 2-digit level. At this level, there is a significant amount of heterogeneity in each occupation group. As one example, consider the "Technicians, except health, engineering and science" group. This includes some occupations that must provide services at a specific location/face-to-face (e.g. airline pilots, air traffic controllers) and others that can

and protectionist sentiment. Thus, the sample includes includes 22 countries in 2003 and 13 countries in 2013. Table 6 in the appendix lists all countries in the samples. The 2013 sample includes 11 countries from the 2003 sample, as well as two newly classified high income countries (the Czech Republic and Slovenia).[25] We have 18,773 and 14,981 respondents in the 2003 and 2013 models, respectively. Both samples use the same measures of independent and dependent variables.

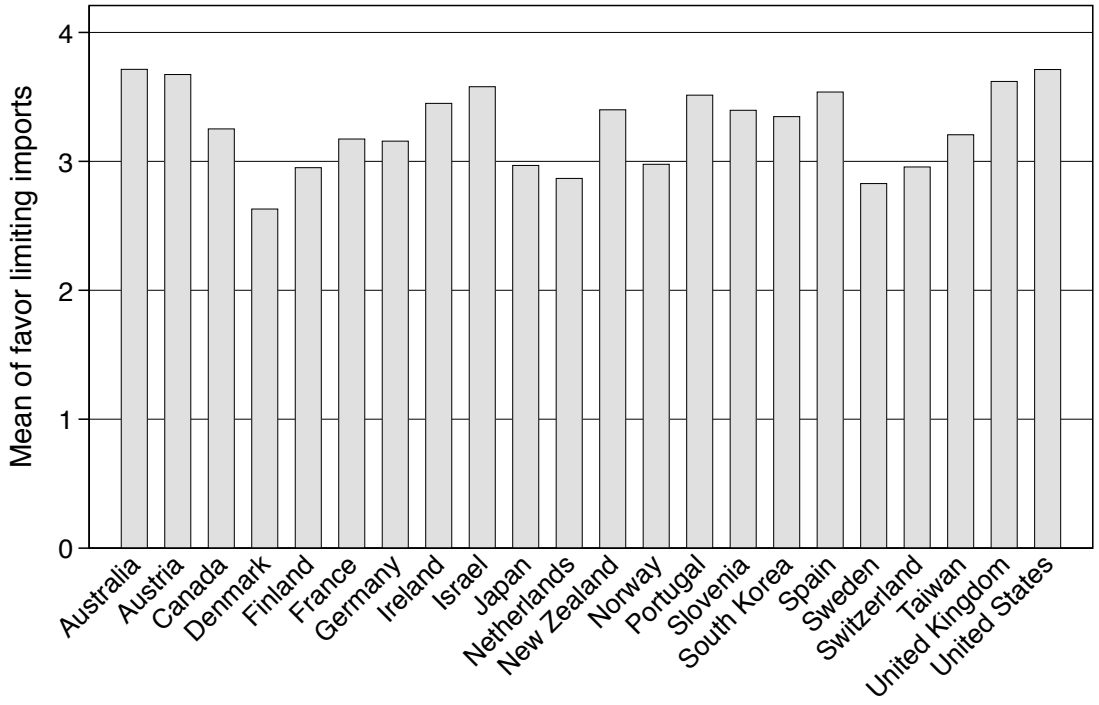
5.1 Dependent variable

Our dependent variable, *Support for trade protection*, measures individuals' protectionist sentiment. Respondents were asked how much they agree or disagree with the statement that their country "should limit the import of foreign products in order to protect its national economy." We examine the following responses: disagree strongly, disagree, neither agree nor disagree, agree, and agree strongly (excluding those who responded 'can't choose'). The advantage of this measure is that it does not refer to goods or services specifically, and thus captures attitudes towards trade in general. The variable ranges from one to five, and higher values indicate greater support for limits on imports, and thus greater protectionist sentiment. The mean level of protectionist sentiment for each country in 2003 is presented in Figure 1. (See corresponding figure for 2013 in supplemental appendix). Denmark has the lowest mean level of support for protection, while Australia and the United States have the highest levels of support for restrictions on imports. We examine additional measures of protectionist sentiment in the supplemental appendix.

provide services over a wire (e.g. computer programmers, legal assistants). Thus within this group, it is impossible to distinguish between fundamentally non-tradable occupations and those occupations that are often used as an example of white-collar jobs subject to offshoring.

[25]High income countries are those with a GDP per capita above $11,500 in real terms. The release of the final sample, including data for additional countries participating in the 2013 module, is still pending from the ISSP.

Figure 1: Mean level of support for trade protection by country in 2003



5.2 Independent variables

Our main independent variables are the occupation characteristics of *Routineness* and *Offshorability*. To measure these concepts, we use occupation-based measures generated by Acemoglu and Autor (2011) and supplement with alternatives from Blinder (2007) and Blonigen and McGrew (2014). Because these measures have not yet been used in political science to the best of our knowledge, we discuss how Acemoglu and Autor (2011) use information on occupation work activities and work context to generate occupation-specific measures of routineness and offshorability.[26] Occupation tasks are classified as either cognitive routine tasks, abstract (i.e. non-routine) cognitive tasks, location-specific tasks, etc., using detailed information occupation information available from the United States O*Net (Occupational Information Network) database (Acemoglu and Autor, 2011).[27] Tasks are coded and scores

[26]See Autor, Levy and Murnane (2003) for seminal measures of occupation task content.

[27]An examination of the O*Net dictionary illustrates very clearly the difference between skills and abilities required for a given occupation, and the characteristics of tasks, which are

for each metric are bundled together to create occupation-specific measures of routineness and offshorability.[28] For example, an occupation for which work context includes many tasks that must be completed in person receives a low score in terms of offshorability.[29]

Our first independent variable is *Routineness*, which is measured by combining the scales for routine manual and routine cognitive tasks to create an index of task routineness.[30] Higher values indicate occupations are more intensive in routine tasks. The measure is centered, and ranges from -5.93 to 4.87, with a mean of 0 and standard deviation of 1.35, and is normally distributed. We expect that as occupation routineness increases, protectionist sentiment will increase as well. In robustness checks, we use a scale of relative routineness as in Blonigen and McGrew (2014).

Our second independent variable is *Offshorability,* which captures the degree to which tasks must be performed face-to-face, on site or through the provision of personal care based on work activities and context associated with that same occupation. For instance, necessary skills and abilities could include a specific scientific background or creativity, while work activities include such things as "processing information" or "documenting/recording information" and work context includes whether work occurs in person, over the phone, via memos, etc. It is the latter two that form the basis of the measures of routineness and offshorability.

[28]See the appendix for details on our procedure for matching the Acemoglu-Autor measures (2000 SOC) to the ISSP occupation codes (1988 International Standard Classification of Occupations).

[29]For a more additional discussion of the construction of these measures, see Acemoglu and Autor's (2011) replication materials.

[30]Acemoglu and Autor create scales that measure the degree to which an occupation's tasks are: routine cognitive, routine manual, non-routine manual (physical and personal) and non-routine cognitive (analytical and personal). After placing all measures on a positive scale, we add the first two dimensions to produce our index of task routineness.

(Acemoglu and Autor, 2011), and it is thus a measure of vulnerability to competition from foreign labor. We use the index created by Acemoglu and Autor (2011) as our primary measure of offshorability. Higher values indicate greater offshorability. The centered measure ranges from -2.66 to 3.20, with a mean of 0 and standard deviation of 0.84. We use an alternative measure of offshorability developed by Blinder (2007) in robustness checks.[31]

The existing literature suggests a number of additional factors that may shape trade preferences. First, we include *Years of schooling* as a measure individuals' skill endowments.[32] We expect that those who are more skilled (in developed countries) will be less protectionist as predicted by factor endowments theory. This is also consistent with the implications of intra-industry trade for the welfare of workers as suggested by Beaulieu, Benarroch and Gaisford (2011) and Chase (2008).[33] Moreover, education may also influence attitudes toward trade for reasons that are unrelated to its implications for material well-being, as suggested by, for instance, Hainmueller and Hiscox (2006) and Mansfield and Mutz (2009).

Second, we include measures of exposure to trade as suggested by sectoral theories. Because the ISSP does not ask respondents directly about their industry of employment, we generate industry controls based on occupation, similar to Mayda and Rodrik (2005). First,

[31]Blinder and Krueger (2013) find that survey respondents do fairly well in classifying their own offshorability (self-reported offshorability agreed with expert coder assessments 70.2 percent of the time), which suggests that individuals do recognize this dimension of competition from international trade.

[32]See, for example, Blonigen and McGrew (2014), Mayda and Rodrik (2005) and Scheve and Slaughter (2001). Although occupation mean wage is sometimes used as an alternative measure of skill, this measure is inappropriate given our theory, because occupation mean wage treats skill as an occupation characteristic rather than as an endowment of the individual.

[33]Though most intra-industry trade accounts do not incorporate labor, the distributional consequences are mitigated relative to inter-industry trade (Milner, 1988), but can still negatively affect the scarce factor (Krugman, 1981).

we construct a dummy variable, *Manufacturing*, equal to one for manufacturing occupations as defined in Mayda and Rodrik (2005). We expect those in manufacturing industries to be more protectionist than those in other sectors.

Second, we construct a measure of occupation exposure to trade in goods across goods-producing industries.[34] For each goods-producing industry, we use data on imports and exports in 2002 (2012) from the OECD STAN database to generate a dummy variable indicating whether an industry is one of comparative advantage or comparative disadvantage. Following Mayda and Rodrik (2005), we define an industry of comparative advantage as one in which net adjusted imports are less than zero and an industry of comparative disadvantage is one in which net adjusted imports are greater than zero. We construct occupation industry weights for all countries using data on U.S. occupational employment across industries in 2002 from the Occupational Employment Statistics (OES) from the U.S. Bureau of Labor Statistics (BLS). For each occupation, we generate a measure of exposure to industries of comparative advantage and disadvantage, weighted by occupation employment shares in each industry. Thus, for each occupation, *Comparative (dis)advantage* is sum of comparative (dis)advantage in each industry weighted by the share of the occupation's employment in that industry.[35] Comparative advantage and comparative disadvantage range from zero to one and both are logged to account for skewness. For those occupations that are not exposed to trade in goods, both comparative advantage and disadvantage are equal to zero.[36]

We control for two additional labor market variables: unemployment status and union

[34]This measure is motivated by the approach of Mayda and Rodrik (2005), who assigned individuals to industries based on occupation by visually matching occupations to either a manufacturing industry, primary goods industry or as non-tradable (with at most two industries per occupation). See Jensen (2011) for a discussion of the limitations on measures of trade in services at the industry level.

[35]See the supplemental appendix for additional details on the calculation of this measure.

[36]The occupations not exposed to trade in goods are determined at the sub group level and include the following: 11 - Legislators and senior legislators, 23 - Teaching professionals, 33 - Teaching professional associates, 51 - personal and protective services, 52 - models,

membership. *Unemployed* and *Union member* are equal to one for individuals who are unemployed and union members, respectively. We expect those who are unemployed or who are union members to be more protectionist, compared to the reference categories.

The existing literature suggests important non-labor market factors that may also shape attitudes toward trade. First, we control for respondents' sex because women are shown to be more protectionist than men in a number of studies. See Blonigen and McGrew (2014) for an analysis of this topic. Second, we control for age. Third, we include an index of nationalist sentiment to control for the effect of nationalism, as suggested by, for instance, Mansfield and Mutz (2009).[37] Higher values indicate greater nationalist sentiment and we expect those who are more nationalistic will be more protectionist.

Summary statistics for each sample are presented in Table 7 of the appendix. Overall, the samples look very similar in terms of the key independent variables. In Table 2, we present the correlation of key variables for both 2003 and 2013 (the full correlation matrix is presented in the supplemental appendix). Correlations for 2013 are reported in the parentheses. Of particular importance, there is a modest negative correlation between routineness and skill ($\rho = -0.29, -0.24$). This suggests that although individuals with greater skill are more likely to be in non-routine task intensive occupations, these two variables capture different sources of variation in the data, in addition to differing conceptually as suggested by the theory. Moreover, offshorability is not correlated with either schooling or industry trade exposure.

salespersons and demonstrators, 91 - sales and services elementary.

[37]See also Mansfield and Mutz (2013) and Mayda and Rodrik (2005). The measure is a scale created by adding responses to the statements "I would rather be a citizen of [Country] than any other country in the world" and "The world would be a better place if people from other countries were more like people from [Country]."

Table 2: Correlation of key variables in 2003 and 2013

Variables	1	2	3	4	5
Limit imports (1)	1.00 (1.00)				
Routineness (2)	**0.11** (**0.09**)	1.00 (1.00)			
Offshorability (3)	**-0.07** (**-0.08**)	**-0.19** (**-0.24**)	1.00 (1.00)		
Years of schooling (4)	**-0.22** (**-0.22**)	**-0.29** (**-0.24**)	**0.09** (**0.06**)	1.00 (1.00)	
Log comp. adv. (5)	**-0.06** (**-0.02**)	**0.28** (**0.27**)	0.00 (**0.07**)	-0.01 (0.01)	1.00 (1.00)
Log. comp. disad. (6)	-0.01(-0.00)	**0.28** (**0.25**)	**0.04** (**0.08**)	**-0.06** (**-0.02**)	**0.78** (**0.70**)

Correlation for 2013 in parentheses. Bold indicates significance at 95 percent level.

6 Results

We estimate ordinary least squares regression using survey weights.[38] We include country fixed effects to capture important variation in domestic political and labor market institutions, as well as welfare spending and level of development. Fixed effects are suppressed due to space considerations.

6.1 2003

The results for 2003 are presented in Table 3 and include 22 countries. In Model 1, we examine the unconditional effects of routineness and offshorability on protectionist sentiment. The coefficient on routineness is positive and statistically significant, suggesting that as occupational routineness increases, individuals are likely to be more protectionist. This is consistent with Hypothesis 1 and also the findings of Blonigen and McGrew (2014) in the U.S. context. The coefficient on offshorability is negative and statistically significant, suggesting that as vulnerability to offshoring increases, individuals are less likely to hold protectionist attitudes. This is because individuals in highly offshorable occupations include both those whose jobs are likely to be offshored, and those who may experience a benefit from international trade in the form of onshoring.

The control variables have the expected effects. The coefficient on schooling is negative and statistically different from zero in all models. This is consistent with the factor

[38]Results are robust to the estimation of ordered probit models with five categories. These results are available in the supplemental appendix.

Table 3: Analysis of protectionist sentiment in 2003

	1	2	3	4	5
Routineness	0.016**	0.017**	0.030***		
	(0.006)	(0.006)	(0.006)		
Offshorability	-0.069***	-0.076***	-0.082***	-0.088***	
	(0.011)	(0.011)	(0.011)	(0.011)	
Routineness × Offshorability		0.024**	0.023**		
		(0.009)	(0.009)		
Relative routineness				0.723***	0.579***
				(0.129)	(0.118)
Relative routineness × Offshorability				0.273	
				(0.163)	
Offshorable (dummy)					-0.130***
					(0.028)
Relative routineness × Offshorable (dummy)					1.385***
					(0.260)
Years of schooling	-0.054***	-0.054***	-0.057***	-0.053***	-0.054***
	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)
Manufacturing	0.106**	0.107**			
	(0.039)	(0.039)			
Comparative advantage (log)			-0.012***	-0.012***	-0.011***
			(0.003)	(0.003)	(0.003)
Comparative disadvantage (log)			0.006*	0.007*	0.005*
			(0.003)	(0.003)	(0.003)
Nationalism	0.165***	0.165***	0.166***	0.165***	0.166***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Unemployed	0.010	0.010	0.013	0.010	0.007
	(0.066)	(0.066)	(0.069)	(0.069)	(0.068)
Union member	0.012	0.012	0.011	0.012	0.024
	(0.021)	(0.022)	(0.022)	(0.021)	(0.023)
Female	0.279***	0.274***	0.262***	0.254***	0.237***
	(0.026)	(0.027)	(0.026)	(0.027)	(0.025)
Age	-0.001	-0.001	-0.001	-0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	2.010***	2.018***	2.040***	1.992***	2.015***
	(0.107)	(0.107)	(0.116)	(0.117)	(0.117)
Observations	18773	18773	18247	18247	18247
Adjusted R^2	0.19	0.19	0.19	0.19	0.19
AIC	55057.80	55051.05	53662.33	53632.29	53684.73

Cluster robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

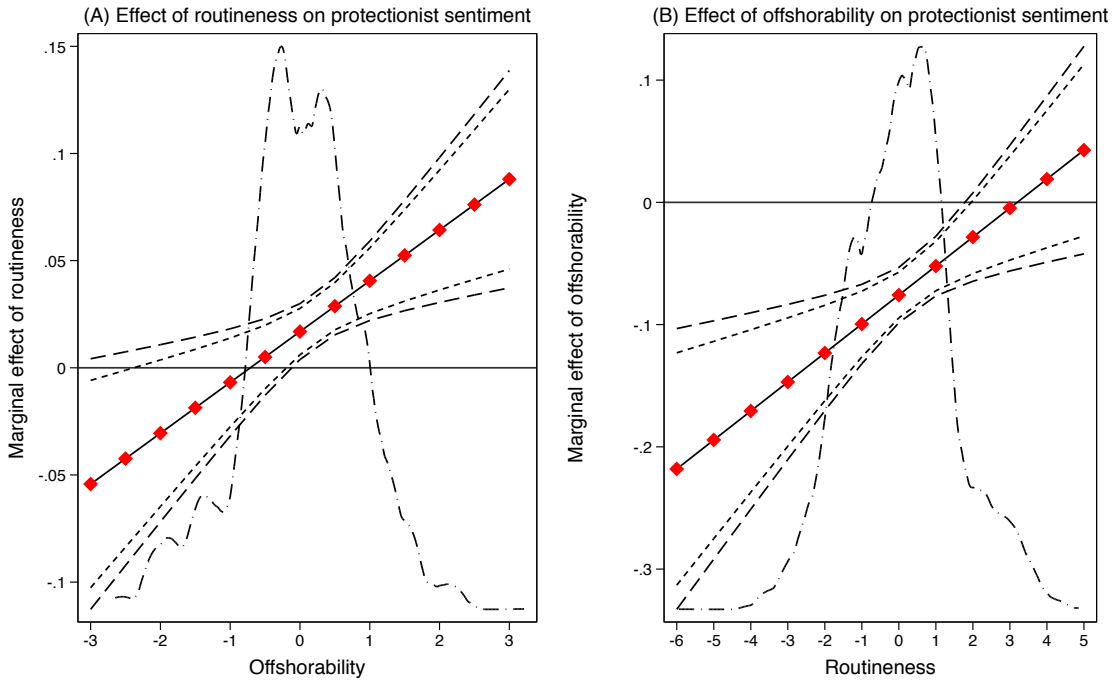
endowments model, as well as robust findings in the literature (e.g Beaulieu, Benarroch and Gaisford, 2011; Mayda and Rodrik, 2005; Hainmueller and Hiscox, 2006; Mansfield and Mutz, 2009). The coefficient on manufacturing is positive and statistically significant, suggesting that those in manufacturing industries are more protectionist. The coefficient on nationalist sentiment is also positive and statistically significant, suggesting that greater nationalist sentiment leads to more protectionist preferences. Additionally, consistent with other studies, women are more likely to be protectionist than are men (for a recent evaluation of this finding, see Blonigen and McGrew, 2014). These findings are robust across the remaining model specifications.

Our theory suggests that the effect of offshorability on trade preferences will depend on routineness and vice versa. In Model 2 we present the first test of our conditional hypothesis by including an interaction between routineness and offshorability. The coefficient on the interaction term is positive and statistically significant as hypothesized. To facilitate the substantive interpretation of the interaction, in Figure 2, we present the marginal effects of routineness and offshorability (along with the distribution of each conditioning variable). In Panel A of Figure 2, we present the marginal effect of a one-unit increase in routineness on protectionist sentiment, conditional on observed levels of offshorability. The marginal effect of routineness is increasing in the level of offshorability and leads to an increase in protectionist sentiment at medium to high levels of offshorability. At low levels of offshorability (less than -1, which includes for instance, health professionals, police officers and mechanics), the marginal effect of routineness is not distinguishable from zero. In other words, for all but those in the least offshorable occupations, an increase in task routineness is associated with an increase in protectionist sentiment. This is consistent with our expectation in Hypothesis 2A, because at low levels of offshorability, individuals are unlikely to be directly exposed to competition of from international trade, regardless of the level of routineness.

In Panel B, we present the corresponding marginal effects plot for the effect of offshorability on protectionist sentiment. A one-unit increase in offshorability has a negative and statistically significant effect on the level of protectionist sentiment at low and medium levels of routineness. In other words, among individuals whose occupations are characterized by low levels of task routineness, an increase in offshorability leads to greater support for

free trade. This finding, that offshorability can reduce protectionist sentiment, is consistent with Hypothesis 2B because those in non-routine jobs are likely to benefit from international trade: occupations that are both offshorable and intensive in non-routine tasks are likely to be onshored. The significance of the interaction term, in combination with an improvment of the AIC statistic compared to that of the non-interactive model, suggest that the interactive model is preferred to the non-interactive model, although the direct effects of offshorability and routineness are also important sources of variation in preferences over trade.

Figure 2: Marignal effects plots for 2003



Estimates from Table 3, Model 2. 90 and 95 % confidence intervals.

In Model 3, we include our occupation-based measures of exposure to trade in goods, comparative advantage and comparative disadvantage, as an alternative source of industry based trade preferences. The sample size is smaller in these models due to missing data. The coefficient on comparative advantage is negative and statistically significant at the 95 percent level, suggesting that those in occupations typically employed in industries of comparative advantage tend to be less protectionist, all else equal. The coefficient on comparative disadvantage is positive and statistically significant from zero at the 90 percent level, suggesting that individuals whose occupations are concentrated in industries that face strong import

competition are likely to prefer trade protection. Although previous studies have often failed to find evidence in favor of sector determinants of preferences, these results suggest it is not industry alone that determines exposure to trade competition, but whether an individual can reasonably expect to find employment in another industry in his/her occupation. In terms of our main results, the coefficient on the interaction between offshorability and routineness remains positive and statistically significant. The substantive marginal effects follow a similar pattern to those from Model 2 and are available in the supplemental appendix.

In the final two models of this table, we discuss two key robustness checks, which utilize alternative measures of the independent variables. First, in Model 4, we examine the robustness of our findings to an alternative measure of routineness, using a relative measure of task routineness as suggested by Blonigen and McGrew (2014). This measure of relative routineness captures the importance of routine tasks relative to all tasks (routine and non-routine).[39] The coefficient on the interaction is positive, as expected, but not statistically different from zero. However, the marginal effects, presented in Figure 5 in the appendix, follow a similar pattern to those in previous specifications. The marginal effect of relative routineness is increasingly positive as offshorability increases, and is statistically different from zero at all but the lowest levels of offshorability at the 90 percent level. Thus, as routine tasks become a larger portion of total tasks, an increase in offshorability is likely to lead to an increase in protectionism. The marginal effect of offshorability is negative but increasing in the level of routineness. An increase in offshorability leads to a statistically significant decrease in protectionist sentiment at all but the highest values of relative routineness.

Finally, in Model 5, we examine an alternative measure of offshorability created by Blinder (2007). We generate a dummy variable equal to one if an occupation is coded as offshorable or highly offshorable and zero if coded as non-offshorable or highly non-offshorable by Blinder.[40] We interact this with the measure of relative routineness and again the coefficient on the

[39]To measure relative (weighted) routineness, we divide the index of routineness by total routine and non-routine measures. This is equal to (manual and cognitive routine)/(manual routine+cognitive routine+manual non-routine and cognitive non-routine).

[40]See the data appendix for further details.

interaction is positive and statistically different from zero. The marginal effects are presented in the supplemental appendix. We again find support for our theory. The effect of a one-unit increase in relative routineness is positive and different from zero for all individuals, however, the effect is greater for those in offshorable occupations, and a shift from a non-offshorable to an offshorable occupation leads to a decrease in protectionism at low to medium levels of relative routineness.

6.2 Results for 2013 and comparison to 2003 results

We now turn to the results in the 2013 sample. Although this sample includes a smaller set of countries, it is important to test our theory using more recent data. We estimate the same model specifications as in the 2003 case and the results are presented in Table 4. As in the 2003 case, we find support for our hypothesis that the effect of routineness is conditional upon offshorability (and vice versa). A comparison of Models 1 and 2 indicate greater support for the interactive model. In the interest of space, we discuss the main results of interest for the preferred model specification (Model 2). We graph the marginal effects of routineness and offshorability in Figure 3. The results in 2013 look similar to those for 2003 in Figure 2. At high levels of offshorability, an increase in task routineness leads to an increae in protectionist sentiment as shown in Panel A. As above, the effect of offshorability on protectionist sentiment is increasing in the level routineness as shown in Panel B.

One difference between the 2003 and 2013 samples emerges in Model 3, which is that the coefficients on industry comparative advantage and disadvantage are not statistically different from zero in the latter sample. In Models 4 and 5, we perform analogous robustness checks to the above sample and again find support for our hypotheses. The marginal effects for Model 4 are presented alongside the same results from 2003 in Figure 5 in the appendix. All additional marginal effects plots are available in the supplemental appendix.

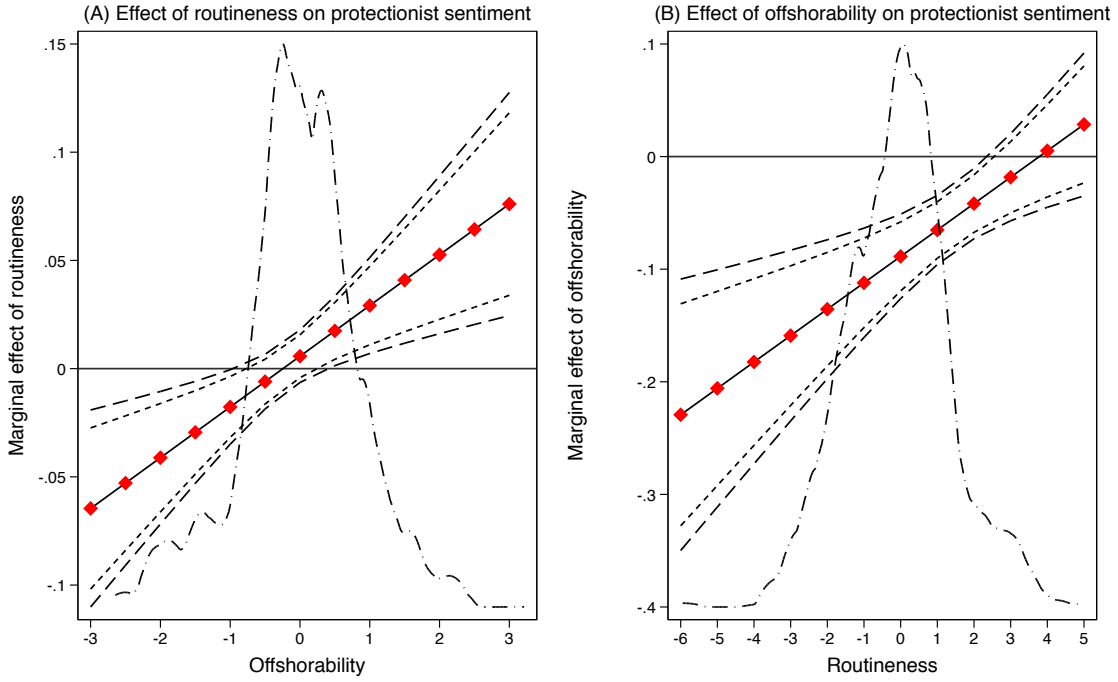
We next estimate our preferred model specification for the 2003 and 2013 samples, including only those countries that appear in both samples. The results are presented in Models 1 and 2 of Table 5. For ease of comparison, we plot the coefficients with 95 percent confidence intervals in Figure 4. The results suggest that there is very little fluctuation in the

Table 4: Analysis of protectionist sentiment in 2013

	1	2	3	4	5
Routineness	0.008	0.006	0.017*		
	(0.006)	(0.006)	(0.008)		
Offshorability	-0.083***	-0.089***	-0.095***	-0.094***	
	(0.016)	(0.017)	(0.018)	(0.017)	
Routineness × Offshorability		0.023***	0.021**		
		(0.007)	(0.008)		
Relative routineness				0.569***	0.658***
				(0.165)	(0.181)
Relative routineness × Offshorability				0.160	
				(0.169)	
Offshorable (dummy)					-0.144***
					(0.035)
Relative routineness × Offshorable (dummy)					0.646*
					(0.304)
Years of schooling	-0.053***	-0.053***	-0.055***	-0.053***	-0.052***
	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)
Manufacturing	0.143***	0.146***			
	(0.036)	(0.037)			
Comparative advantage (log)			-0.005	-0.006	-0.003
			(0.005)	(0.005)	(0.006)
Comparative disadvantage (log)			0.003	0.003	0.001
			(0.004)	(0.004)	(0.004)
Nationalism	0.145***	0.145***	0.146***	0.145***	0.146***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Unemployed	0.002*	0.002*	0.002*	0.002*	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Union member	0.061	0.062*	0.060	0.062*	0.075*
	(0.034)	(0.034)	(0.035)	(0.034)	(0.036)
Female	0.242***	0.236***	0.222***	0.218***	0.203***
	(0.028)	(0.028)	(0.028)	(0.029)	(0.025)
Age	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	3.004***	3.008***	3.054***	3.012***	3.040***
	(0.126)	(0.127)	(0.150)	(0.153)	(0.153)
Observations	14981	14981	14981	14981	14981
Adjusted R^2	0.19	0.19	0.19	0.19	0.19
AIC	44581.74	44575.42	44602.98	44587.26	44637.03

Cluster robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 3: Marginal effects plots for 2013



Estimates from Table 4, Model 2. 90 and 95 % confidence intervals.

size or significance of the relationship between routineness, offshorability and protectionist sentiment, even in two samples from the same population separated by 10 years. This suggests that occupation and concerns about offshoring/onshoring continue to be an important determinant of trade preferences.

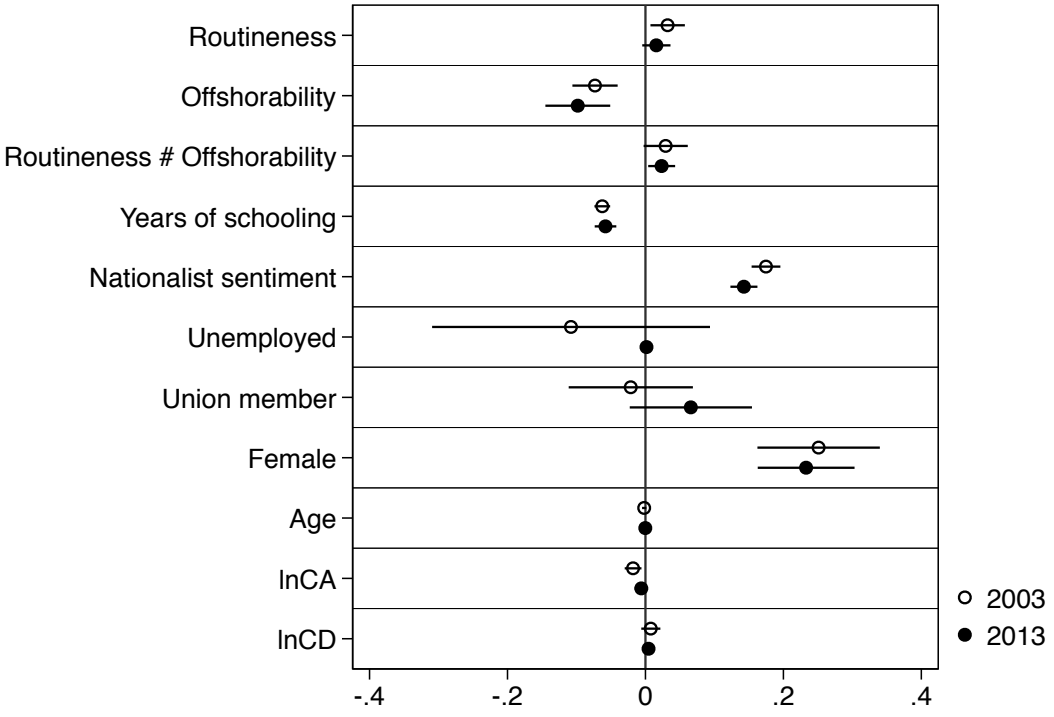
Finally, we perform a number of additional robustness checks available in the supplemental appendix. First, we examine alternative measures of protectionist sentiment. Second, we report the results of ordered logistic regressions. Finally, we examine the interaction between schooling and offshorability, as suggested by Walter (2014), who finds that the effect of offshorability on perceived job insecurity depends on skill level. In all specifications, we continue to find support for our theory that trade preferences are a function of occupational routineness conditional upon offshorability.

Table 5: Side by side analysis of 2003 and 2013

	2003 (1)	2013 (2)
Routineness	0.032**	0.016
	(0.011)	(0.009)
Offshorability	-0.073***	-0.098***
	(0.015)	(0.021)
Routineness × Offshorability	0.029*	0.024**
	(0.014)	(0.009)
Years of schooling	-0.063***	-0.058***
	(0.005)	(0.007)
Comparative advantage (log)	-0.018***	-0.006
	(0.005)	(0.004)
Comparative disadvantage (log)	0.008	0.005
	(0.006)	(0.003)
Nationalism	0.175***	0.143***
	(0.009)	(0.009)
Unemployed	-0.108	0.002
	(0.090)	(0.001)
Union member	-0.021	0.066
	(0.040)	(0.040)
Female	0.251***	0.233***
	(0.040)	(0.032)
Age	-0.002	-0.000
	(0.001)	(0.000)
Constant	2.127***	2.379***
	(0.175)	(0.181)
Observations	9075	12484
Adjusted R^2	0.18	0.20
AIC	27167.58	36765.53

Sample restricted to countries in both years. Cluster robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 4: Regression coefficients from restricted 2003 and 2013 samples



7 Conclusions

The fragmentation of international production has transformed the nature of international trade. We argue that a new theory of the distributional consequences of trade is needed if we are to understand how this new face of globalization affects workers. Building on the trade in tasks literature from economics, we argue that trade today produces competitive pressures at the individual level, and thus the welfare consequences of trade are determined by occupational characteristics, rather than factor ownership or industry exposure to trade. Using survey data from developed countries in 2003 and 2013, we find that as task routineness increases, individuals are more likely to support trade protection and that this effect is increasing in the level of task offshorability. Among those likely to benefit from trade in tasks at low levels of task routineness, an increase in offshorability actually reduces support for trade protection. Together, these findings suggest new patterns of protectionist sentiment that cannot be accounted for by the existing literature. Not only do we find support for our theory in two samples separated by 10 years, which suggests that this finding is not fleeting

or spurious, this is the first paper (to the best of our knowledge) to examine the 2013 ISSP data.

The findings of this paper have several important implications for the politics of trade. First, further research must first take into account the conditions under which occupational coalitions are likely to form in lieu of factor or sector-based coalitions. This article focuses on clarifying an occupational theory of trade preferences, but does not integrate the occupation model with the HO and RV models in a larger theoretical framework. Such a framework could predict when one type of trade cleavage will emerge rather than another, depending on factor mobility. Second, future research should examine the implications of these coalitions for the politics of protection, including how the diffuse preferences of labor interests are aggregated to shape policy outcomes. For instance, occupation-based lobbies were not common historically, because in the past, many individuals would work for the same employer over the course of a career. Today, with individuals likely to change employers multiple times, it is difficult for labor to find a way to organize, especially when peers in the same occupation are spread across many different employers. Thus fragmented production has important implications for the ability of labor to influence policy. Finally, the findings suggest new sources of protectionist sentiments that politicians must address in order to maintain sufficient support for continued openness.

Appendix

Data

Table 6: Sample country composition

2003	2013
Australia, Austria, Canada, Denmark, Finland, France, Germany Ireland, Israel, Japan, Netherlands, New Zealand, Norway, Portugal, Slovenia, South Korea, Sweden, Switzerland, Taiwan, United Kingdom, United States	Czech Republic, Denmark, Finland, France, Iceland, Ireland, Israel, Japan, Norway, Slovenia, Switzerland, Taiwan, United Kingdom

We use data provided by Acemoglu and Autor (2011) to construct measures of routineness and offshorability.[41] The Acemoglu and Autor's (2011) measures are available using the 2000 US Standard Occupational Classification (SOC), while the ISSP reports occupations using the 1988 International Standard Occupational Classification (ISCO-88) scheme. We utilize a concordance table to match between the two. In cases where an ISCO-88 occupation includes multiple SOC occupations, we use the average scores for those SOC occupations. For example, consider an excerpt from the ISCO-88 major group "Professionals," which is structured as follows:[42]

- Physical, Mathematical and Engineering Science Professionals (21)
  - Physicists, chemists and related professionals (211)
    - Physicists and astronomers (2111)
    - Meteorologists (2112)
    - Chemists (2113)
    - Geologists and geophysicists (2114)

[41] The original data is available at http://economics.mit.edu/faculty/dautor/data/acemoglu.

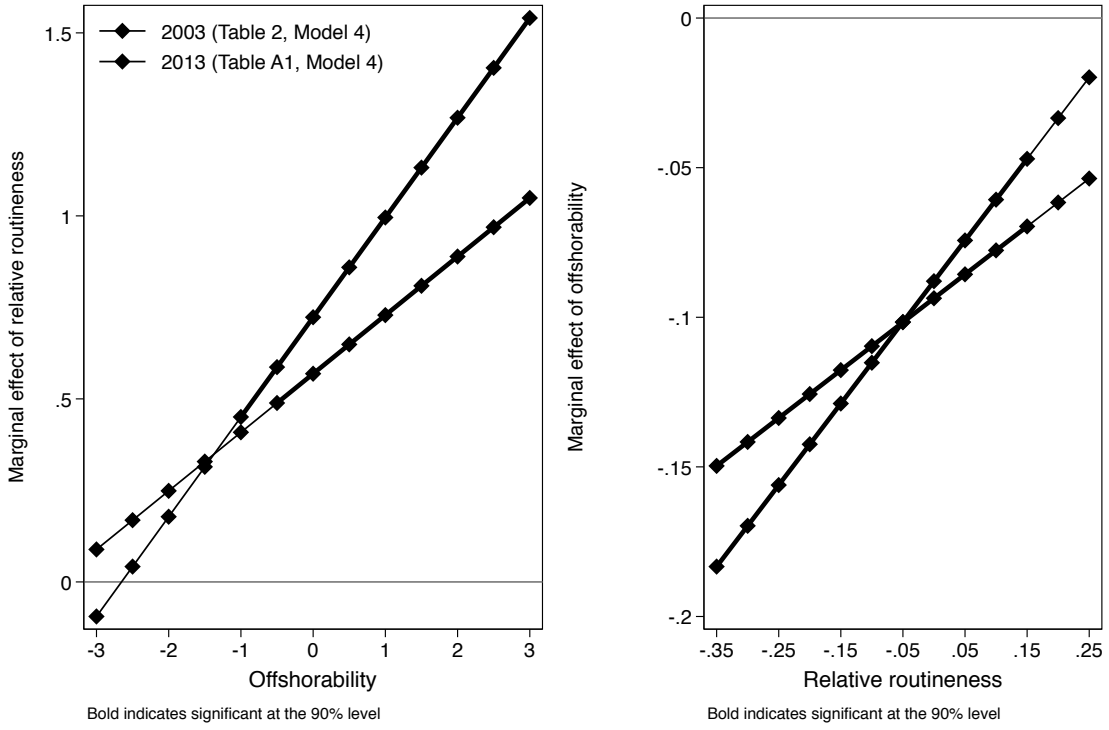
[42] See classification at http://www.ilo.org/public/english/bureau/stat/isco/isco88/major.htm.

Therefore, if an individual is coded 211, we assigned the mean routineness and offshorability score for the occupations 2111-2114. We match iteratively to ensure that occupations are scored at the most disaggregated level possible. In our robustness checks, we generate a dummy variable for offshorable occupations using Blinder's (2009) index. This index ranges from 0 to 100, but Blinder advises that the measure is best thought of as a categorical variable with four categories: highly non-offshorable (0-25), non-offshorable (26-50), offshorable (51-75), and highly offshorable (76-100). Our dummy variable, *Offshorable occupation*, is equal to one for individuals in the offshorable and highly offshorable categories, and zero otherwise.

Table 7: Summary statistics

	2003					2013				
Variable	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N
Limit imports	3.27	1.17	1	5	18773	3.22	1.19	1	5	14981
Routineness	0.06	1.39	-5.94	4.85	18773	-0.07	1.41	-5.94	4.85	14981
Offshorability	0	0.83	-2.65	3.21	18773	0	0.83	-2.65	3.21	14981
Years of schooling	12.43	3.77	1	20	18773	13.47	3.65	0	20	14981
Comp. adv. (Log)	-6.97	3.69	-11.51	-0.04	18247	-6.67	3.92	-11.51	-0.01	14981
Comp. disadv. (Log)	-6.52	3.8	-11.51	0	18247	-6.57	4.02	-11.51	-0.01	14981
Manufacturing	0.16	0.37	0	1	18773	0.14	0.35	0	1	14981
Nationalist sentiment	6.93	1.78	2	10	18773	6.85	1.73	2	10	14981
Unemployed	0.04	0.2	0	1	18773	0.57	7.26	0	99	14981
Union member	0.52	0.5	0	1	18773	0.51	0.5	0	1	14981
Female	0.48	0.5	0	1	18773	0.51	0.5	0	1	14981
Age	46.3	15.21	17	97	18773	52	55.67	15	999	14981
Relative routineness	0	0.09	-0.34	0.25	18773	0	0.08	-0.34	0.25	14981
Offshorable (dummy)	0.17	0.37	0	1	18773	0.17	0.37	0	1	14981

Figure 5: Marginal effects of relative routineness and offshorability



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