Challenges Confronting the Canadian Automotive Parts Industry: What Role for Public Policy?

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Dans cet article, nous analysons un sondage que nous avons mené, auprès de dirigeants d'usines canadiennes de pièces d'automobiles, qui portait sur des questions liées à l'innovation et à l'influence des politiques gouvernementales sur les stratégies et la performance des usines sur le plan de la concurrence. Nous examinons trois questions : a) Les politiques contribuent-elles au succès des usines, ou le freinent-elles ? ; b) La situation des usines appartenant à des intérêts canadiens diffère-t-elle de celle des usines appartenant à des intérêts étrangers ? ; et c) La situation des usines de petite et de moyenne taille est-elle différente de celle des grandes usines ? Nous menons d'abord notre analyse dans le contexte de l'ensemble du secteur automobile et des récentes politiques canadiennes manufacturières et de l'automobile, puis nous concluons en montrant les implications de nos observations sur la mise en place de futures politiques.

Mots clés : industrie des pièces automobiles, politique manufacturière canadienne, politique automobile

This article reports on a recent survey of Canadian automotive component manufacturing plant managers that focused on issues related to innovation and the influence of public policy on plant-level competitive strategies and performance. Three questions are addressed: (a) Do public policies inhibit or contribute to plant success, (b) does the experience of Canadian-owned plants differ from that of foreign-owned plants, and (c) does the experience of small- and medium-sized plants differ from that of large plants? The analysis is first situated within the context of the industry and recent Canadian automotive and manufacturing policy and concludes with the implications of our findings for public policy development.

Keywords: automotive parts industry, Canadian manufacturing policy, automotive policy

Introduction

After 1980, a growing neo-liberal antipathy toward direct state intervention eclipsed industrial policy in many advanced economies. In the wake of the 2008–2009 financial crisis, however, attention once again turned to the role of government-led industrial policy in shaping the competitive and innovation capacity of key economic sectors (see Cowling and Tomlinson 2011; Wade 2009). In Canada, the automotive industry has long been shaped by critical federal and provincial government policy interventions (Anastakis 2005, 2013). Besides the Auto Pact, Canada's iconic 1965 managed automotive trade agreement with the United States, and programs that enticed Asian original equipment manufacturers (OEMs) to establish vehicle assembly plants in Canada in the 1980s, the industry benefited from non–sector-specific federal research and development (R&D) tax credits, publicly funded industrial research, and skilled immigration policies. The industry, which is heavily concentrated in Ontario, also benefited from the sectoral training initiatives adopted as part of the progressive competitiveness strategy of the Ontario Liberal and New Democratic

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Party governments during the period from 1985 to 1995 (Rutherford and Holmes 2008a, 2008b; Yates and Vrankulj 2006).

The neo-liberal shift to free trade under the Canada–US Free-Trade Agreement (1989) and the North American Free-Trade Agreement (1994) did signal a lessening of government interest in overall industrial policy. The striking down of the Auto Pact by the World Trade Organization in 2001 "signaled the death knell of creative policy making in the auto field [such that] there was little left in the government's policy cupboard when it came to shaping the Canadian auto sector" (Anastakis 2013, 333).[1] As a result, and with Canada's seeming inability to secure further new OEM assembly plant investment, the Canadian Automotive Partnership Council was formed. The council immediately called for government incentives to attract new investment, and by mid-decade the federal Program for Strategic Industrial Projects (PSIP) and the Ontario Automotive Investment Strategy (OAIS) had secured new investments, including renewal of existing Ford and GM plants and a new Toyota assembly plant in Woodstock, Ontario. Shortly thereafter, the 2008–2009 global financial crisis forced a major restructuring of the North American automotive industry. The US and Canadian federal governments and the Ontario provincial government were each heavily involved in the 2009 bankruptcy restructuring of GM and Chrysler (Stanford 2010). The restructuring reduced the manufacturing footprints of both GM and Chrysler and had far-reaching impacts on suppliers, including numerous plant closings and a consolidation of the supply base (see Sweeney and Mordue 2017).

Today, Canadian-based automakers and suppliers must contend with a wave of disruptive technologies currently sweeping across the industry. These technologies include new propulsion systems and the drive to reduce vehicle weight to meet ever more stringent government-mandated fuel economy and vehicle emissions regulations and the development of "connected" and autonomous vehicle technologies. Such developments have renewed interest in more assertive government policy and highlighted the drawback of being overly reliant on a strategy of incremental innovation involving only limited R&D, a strategy followed by many Canadian suppliers in the past (Rutherford and Holmes 2008a, 2008b).

Thus, public policy once again is perceived as critical to the future of the Canadian automotive industry and to the future of the automotive parts industry in particular (Boothe 2015). There is relatively little systematic study, however, of how firms, especially at the plant level, are adjusting their competitive and innovation strategies to deal with current challenges and how they perceive public policy as facilitating or hindering such strategies. In this article, we report on a survey of Canadian automotive component plant managers conducted in late 2015.[2] The survey results allow us to address the following key questions:

1. To what degree do public policies inhibit or contribute to plant success?
2. Does the experience of Canadian-owned plants differ from that of foreign-owned plants?
3. Does the experience of plants owned by small- and medium-sized enterprises (SMEs) differ from that of larger plants?

Before turning to the survey results, we first situate our study within the context of the industry and recent Canadian automotive policy. The article concludes with an assessment of the implications of our findings for public policy development.

Canadian Automotive Parts Industry: Background

In 2015, the automotive parts industry employed more than 70,700 of the approximately 112,000 workers in the Canadian auto industry (Keenan 2016).[3] Rather than a single industry, the automotive parts sector comprises several subindustries using diverse manufacturing processes to produce a wide range of parts from highly machined engine components to metal stampings to seats to plastic trim. Firms producing automotive tooling—dies, moulds, fixtures, and other tools—also constitute an important segment of the automotive industry in Ontario.

An assembled vehicle contains thousands of individual parts and components acquired from a multitude of independent suppliers organized into complex supply chains and production networks. Suppliers are commonly referred to as *Tier 1, Tier 2,* or *lower tier,* descriptors that refer to the commercial distance between the OEM automaker and supplier. Automotive parts production in Canada is carried out in (a) large Tier 1 and 2 plants, operated by Japanese-, American-, European- and a handful of Canadian-owned global parts suppliers, and (b) a large number of Canadian-owned small- and medium-sized Tier 2 and Tier 3 firms that primarily feed assembly plants and higher tier component producers in both Canada and the United States. Canada's automotive industry is heavily concentrated in southern Ontario and forms an integral part of the major and historically important automotive production region encompassing Ontario and the U.S. Great Lakes states of Michigan, Ohio, Indiana, Illinois, Wisconsin, and New York. Within this region, there is extensive movement of parts in both directions across the international border.

In the early 2000s, and after several decades of sustained growth in output and employment, Canada's automotive industry faltered. The closing of four D-3

(GM, Ford, and Chrysler, which is now Fiat Chrysler Automobiles) assembly plants in Canada between 2002 and 2008 had a negative impact on both vehicle output and automotive parts production and employment. By 2008, annual vehicle output had shrunk by a third from a peak 3.06 million vehicles in 1999, and employment in the combined assembly and parts sectors fell by 20 percent between 2000 and 2008 (Rutherford and Holmes 2014). What began as a gradual decline in the early 2000s quickly accelerated and culminated in the restructuring of GM and Chrysler triggered by the 2008–2009 financial crisis. Since 2010, the North American automotive industry has rebounded, with record vehicle sales in the United States and Canada in each of the past 2 years, a recovery in vehicle production in the United States, and a surge in new assembly capacity in Mexico. The recovery of Canadian automotive production, however, has been much more muted (Rutherford and Holmes 2014).[4] In 2015, 2.27 million light vehicles were produced in Canada, 43 percent of which were produced by Japanese OEMs Toyota and Honda.[5]

Canadian Public Policy and the Development of the Automotive Parts Industry

The crucial role played by federal government trade and industrial policy, and especially the central importance of the Auto Pact, in shaping the development of the Canadian automotive industry is well documented (Anastakis 2005, 2013; Holmes 2004; Traves 1979). The 1965 Auto Pact facilitated the rationalization and full integration of Canadian automotive production with its US counterpart. Canadian vehicle production expanded rapidly after 1965, and the Canadian value-added requirements in the Auto Pact encouraged expanded parts production in Canada (Holmes 1983). In the 1980s, Canada used Duty Remission Orders and the possibility of eventually attaining Auto Pact producer status to entice Honda, Toyota, Canadian Automotive Manufacturing Inc. (a GM–Suzuki joint venture), and Hyundai to build assembly plants in Canada (Anastakis 2013; Johnson 1993).[6] Expanding vehicle assembly capacity in Ontario during the 1980s and 1990s provided a growing market for automotive parts and tooling (Rutherford 2000) and directly helped foster the growth of Canadian parts firms such as Magna, Woodbridge Foam, and AG Simpson (Anastakis 2013, 311).

Canadian federal and provincial governments (especially in Ontario) used other, more indirect measures in support of the auto parts industry. As part of a broader state strategy aimed at "Canadianizing" key economic sectors by facilitating the growth of "threshold" SMEs (Britton et al. 1996), programs designed to create and enhance value were directed toward the development of a more R&D-intensive and Canadian-owned automotive supply base (Rutherford and Holmes 2008a). The federal Industrial Research Assistance Program was central in assisting Canadian-owned suppliers to upgrade technology and finance capacity expansion; Magna's rapid growth during the 1980s, for example, relied heavily on the program's assistance (Anderson and Holmes 1995).

Between 1985 and 1995, Ontario Liberal and New Democratic Party governments adopted a policy of "progressive competitiveness" aimed at developing a high-skill, high-wage manufacturing sector. A key element of this strategy was a sectoral-based approach to training and skill development. In the automotive sector, this approach took the form of the Auto Parts Sectoral Training Council, established as a joint government, union, and management partnership by the Ontario New Democratic Party government in 1991. The council was designed to develop transferable skills using community colleges as a focal point for firm employee training programs. Although the council met with some success, it was abolished after the neo-liberal Progressive Conservative government came to power in 1995 (Rutherford 1998). However, the legacy of the progressive competitive model that combined provincial investments in community college–based higher education with the federal government policy of skilled labour immigration secured an ample supply of skilled workers for automotive parts firms in southern Ontario and established a competitive advantage relative to many US states (Rutherford and Holmes 2013a; Yates and Vrankulj 2006).

Recent Public Policy Framework for the Automotive Industry in Canada

Business strategies in many manufacturing industries are influenced by general areas of government legislation or regulation such as corporate and payroll-related taxes, the regulated cost of electricity and other utilities, and laws and regulations governing employment and labour relations. In the case of export-oriented sectors, such as automotive, the effect of monetary policy on the currency exchange rate and government support for export development can be critical.[7]

Table 1 summarizes the range of federal and provincial government programs that have over the past decade provided support to the automotive industry. Programs such as PSIP, OAIS, Automotive Innovation Fund (AIF), Automotive Supplier Innovation Program, Auto21, and Automotive Partnership Canada (APC) have directly targeted the automotive industry. Others are more general cross-sectoral programs that have been taken up within the automotive industry, especially by automotive parts firms.

Direct Assistance to the Automotive Industry

Several government programs introduced within the past decade have directly assisted both OEMs and automotive parts firms. Earlier, we mentioned the federal PSIP

Table 1: Federal and Ontario Automotive Support Programs, 2004–Present

Ontario Provincial Programs		Federal Programs	
Automotive Sector Specific	Cross-Sector	Automotive Sector Specific	Cross-Sector
Ontario Automotive Innovation Strategy: $500 million between 2004 and 2009; grants and loans for large-scale investments in new process technologies	Jobs and Prosperity Fund: $2.7 billion between 2015 and 2025; financing for large-scale SME innovation projects	Automotive Supplier Innovation Program: $100 million between 2015 and 2020; financing for SMEs developing new automotive technologies	FedDev—Investing in Business Growth and Productivity: Provides grants and loans to SMEs for the development and adoption of new product and process technologies and/or diversification into new markets
	Next Generation of Jobs Fund: $1.15 billion between 2009 and 2014; grants for research, development, and commercialization of new technologies	Automotive Innovation Fund: $1 billion between 2008 and 2018; financing for large-scale R&D projects and long-term investments in the Canadian automotive sector	Industrial Research Assistance Program: Provides financing to SMEs for innovation support, including R&D and/or commercialization of new technologies, hiring new staff, and adoption of new process technologies
	Southwestern Ontario Development Fund, Eastern Ontario Development Fund, and Communities in Transition Fund: Provides grants and loans for projects that promote the retention, expansion, or attraction of investment in Ontario	Program for Strategic Industrial Projects: $355 million between 2005 and 2011; grants for automotive research, precompetitive development, and new technology adoption	Scientific Research and Experimental Development: Provides tax credits for basic and applied research, eligible support work, and the development of new technologies
	Advanced Manufacturing Investment Strategy: $500 million between 2005 and 2010; financing for the development of new product and process technologies	Auto21: $81 million between 2001 and 2015; Network of Centres of Excellence funding for applied automotive research	CME SMART Program: $65 million between 2008 and present; direct funding for investments in new production process technologies and more energy-efficient technologies.
		Automotive Partnership Canada: $145 million in research funding to enhance Canadian automotive innovation	Yves Landry AIME: Provides grants of up to $50,000 for worker training related to new innovation

Note: R&D = research and development; SME = small- and medium-sized enterprises
Source: Compiled by authors from various sources

and provincial OAIS incentive-type programs used to attract new OEM and Tier 1 supplier investment in the 2004–2006 period. More recent federal government programs have aimed to provide opportunities for Canada-based suppliers to invest in innovation to move up the automotive value chain (Flavelle 2013). Established in 2008, the AIF initially provided $250 million over five years in repayable loans to support large-scale strategic innovative projects related to the development of more fuel-efficient, "greener" vehicles.[8] In 2013, AIF was renewed with a further $250 million over five years, and a further $500 million over two years was added in 2014. A related AIF goal is to secure R&D mandates and employment in Canada by both foreign-owned OEMs and Canadian parts firms (Industry Canada 2016a). Earlier programs such as PSIP and OAIS were explicitly directed to OEMs and large Tier 1 suppliers. AIF similarly favoured large firms that both could benefit from research being undertaken in universities and also were well positioned to navigate government programs and build long-term relationships with both universities and governments (Rutherford and Holmes 2008b).

The majority of Canadian suppliers, however, are SMEs focused on incremental process and product innovation that does not readily lend itself to formal university–industry research collaborations. Partly in recognition of the needs of SMEs, the federal government recently initiated the Automotive Supplier Innovation Program to provide $100 million over the next five years to assist "research and development projects to become commercially viable by supporting product development and

technology demonstration on a cost-shared basis with participating firms" (Industry Canada 2016b).

Several government initiatives have sought to foster research and development across the Canadian manufacturing sector. Since its inception in the early 1980s, the federal Scientific Research and Experimental Development (SR&ED) Tax Credit incentive program has been of prime importance to the automotive parts industry and is well suited to the incremental nature of innovation that is characteristic of the industry.[9] This raises the broader issue of government support for automotive R&D in Canada. Since the 1960s, federal industrial R&D policy in Canada has primarily been shaped by the so-called "Glassco framework." Under this framework, named for the chair of the 1963 Royal Commission on Government Organization,

> attention was consistently focused on the research orientation of federal science agencies. As a result, little attention was paid to the well-established organizational practices of industrial capital, particularly American transnational capital, that were central to the development of industrial R&D in Canada.... This treatment of internal R&D resources pointed not only to the ongoing refusal to follow state-led industrial strategies as a means of establishing more autonomous technological capabilities, but also the continuing importance of neoliberal principles in the formulation of state policy. (Smardon 2014, 182)

Besides government-operated National Research Council laboratories, support for R&D has been channeled through the creation of specialized, decentralized, and quasi-stakeholder–operated funding agencies to support university-based industrial and scientific research. For example, the Networks of Centres of Excellence, created in 1989 under the aegis of Industry Canada and composed of university-based researchers, were required to partner with private-sector firms to target and develop research with commercial potential, the results of which were to be transferred to the partner firm for commercial exploitation. Between 2001 and 2015, Auto21, the automotive-focused Networks of Centres of Excellence, received $81.2 million in federal government research funding and $68.4 million from private industry to support university–industry research collaborations in a wide range of areas, including vehicle manufacturing ergonomics, fuel cell technology, and new casting and heat-treatment processing technology. Before the recent announcement that its funding will not be renewed beyond 2016, Auto21 had worked with all the major OEMs in Canada and many suppliers (CBC 2015).

More recently, APC, a partnership among five federal research and granting agencies under the Industry Canada umbrella, committed $145 million in research funding over five years for significant, collaborative industry-driven automotive R&D activities. APC research priority areas included improving the environmental performance of vehicles, the cognitive car, and next-generation manufacturing.[10]

With this contextual background regarding both the automotive industry in Canada and the public policy environment within which automotive manufacturers operate, we now turn to an analysis of results from a survey of automotive parts plant managers, results that provide insight into how plant managers perceive the degree to which current public policies inhibit or contribute to the success of their plant.

Survey Methodology

Although research exists on how US automotive parts firms responded in the wake of the 2008–2009 recession (US Department of Commerce 2011), relatively little is known about plant-level strategies adopted by parts firms in Canada, especially those that are Canadian owned, and the influence of public policy in shaping such strategies. We focus on the establishment (manufacturing plant) rather than the firm because this provides a better understanding of how public policy actually affects firm operations on the ground. This is especially important because many automotive parts firms operate multiple plants that may be differentially affected by public policies depending on what category of parts each individual plant produces.

In addition to collecting basic information relating to the plant and its recent performance, at the core of our 10-page survey was a range of questions relating to plant-level competitive strategies, innovation activity, and the perceived influence of public policies on plant performance. Many of these questions were designed to elicit responses along a five-point scale. There was also a final open-ended written response question that asked the plant manager, "What needs to be done to improve the competitiveness of the automotive parts industry in Canada?"

We compiled an initial list of 661 plants in Canada that produce either parts or tooling for the automotive industry.[11] The survey was mailed out in August 2015, and follow-up letters were sent out and phone calls made in the following months in an effort to ensure an adequate response rate. After allowing for plant closures, inaccurately classified plants, and surveys returned as undeliverable by the postal service, the total number of plants surveyed was revised to 558.

Survey Responses

In total, we received 115 completed surveys for a response rate of approximately 21 percent.[12] The responding plants reflected the complexity of automotive supply chains. Although 16 plants reported that they were

Table 2: Key Characteristics of Respondent Plants

Type of Plant (No.)	Plant Ownership (No.)	Subindustry (No.)	Plant Size (No.)
OEM parts (44)	Canada (72)	Engine and drive train (16)	<50 (28)
OEM parts and aftermarket (44)	United States (20)	Stampings and castings (30)	51–100 (23)
Tooling only (17)	Japan (9)	Seating and interiors (20)	101–250 (31)
	Europe (10)	Plastic parts (13)	>250 (31)
	Other (4)	Automotive tooling (17)	

Note: OEM = original equipment manufacturers.
Source: Survey data

Table 3: Plant Managers' Assessment of the Degree to Which Selected Public Policies Inhibit or Contribute to Plant Success: All Respondents

	All Respondents (n = 115)		
Public Policy Measure	Average (Out of 5)	% Contributes (>3)	% Inhibits (<3)
Subsidies and/or tax credits for R&D	3.8	67.0	4.3
Programs to retain or attract vehicle assembly capacity	3.8	61.7	8.7
International trade agreements	3.5	55.7	14.8
Support for workforce training	3.5	49.6	6.1
Road and rail infrastructure	3.4	34.8	3.5
Investments in local public services	3.4	39.1	7.0
Vehicle emission and fuel economy regulations	3.2	26.1	6.1
Export development programs	3.2	29.6	7.8
Federal fiscal policy	3.2	43.5	29.6
Legal requirements related to closure and layoffs	2.7	8.7	33.0
Corporate tax policies	2.7	23.5	47.8
Environmental regulations related directly to plant	2.6	9.6	34.8
Payroll taxes	2.3	17.3	67.0
Electricity costs	2.1	16.5	75.7

Note: Respondents were asked to indicate on a five-point scale the degree to which various public policies inhibit or contribute to the success of their plant (1 = *strongly inhibits*, 2 = *inhibits*, 3 = *neither inhibits nor contributes*, 4 = *contributes*, 5 = *strongly contributes*). R&D = research and development.
Source: Survey data

exclusively Tier 1 suppliers, most reported that they operate as both Tier 1 and Tier 2 suppliers, and only 7 plants reported that they did not supply directly to OEMs or Tier 1 suppliers. Table 2 summarizes some of the key characteristics of the responding plants. There was good coverage with regard to plant size, country of ownership, and industry subsector. However, both plants owned by large Canadian-owned global Tier 1 suppliers and unionized plants are underrepresented in the completed surveys.[13] Notwithstanding these caveats, the survey results provide important insights into both the current state of the industry and how public policy informs competitive and innovation strategies.

In the survey, respondents were asked to indicate on a five-point scale the extent to which, in their opinion, a range of public policy factors inhibit or contribute to the competitive success of their firm. Tables 3, 4, and 5, respectively, summarize the results for all responding plants, by country of ownership (Canadian vs. non-Canadian) and by plant size (SMEs vs. large plants employing more than 250 employees).

Overall, the factors thought to most inhibit plant success were provincially regulated electricity costs and payroll-related taxes, followed by corporate tax policies, legal requirements related to layoffs and closures, and environmental regulations governing plant operations. These factors also figured prominently in the written comments section of the survey, where 68 of the 115 plant managers who responded to the survey offered a total of 154 comments on a variety of issues (Table 6). Both the high cost of electricity and the costs of regulatory compliance were frequently mentioned in the comments as factors impeding plant competitiveness. Some

Table 4: Plant Managers' Assessment of the Degree to Which Selected Public Policies Inhibit or Contribute to Plant Success: Canadian-Owned versus Foreign-Owned Plants

	Canadian-Owned Plants (n = 72)			Foreign-Owned Plants (n = 43)		
Public Policy Measure	Average (Out of 5)	% Contributes (>3)	% Inhibits (<3)	Average (Out of 5)	% Contributes (>3)	% Inhibits (<3)
Subsidies and/or tax credits for R&D	3.8	72.2	4.2	3.7	58.1	4.7
Programs to retain or attract vehicle assembly capacity	3.8	63.9	9.7	3.7	58.1	7.0
Support for workforce training	3.5	55.6	6.9	3.4	39.5	4.7
International trade agreements	3.5	56.9	16.7	3.6	53.5	11.6
Road and rail infrastructure	3.4	36.1	4.2	3.4	32.6	2.3
Investments in local public services	3.3	37.5	6.9	3.4	41.9	7.0
Export development programs	3.3	33.3	8.3	3.2	23.3	7.0
Federal fiscal policy	3.2	44.4	31.9	3.3	41.9	25.6
Vehicle emission and fuel economy regulations	3.2	22.2	5.6	3.4	32.6	7.0
Legal requirements related to closure and layoffs	2.7	8.3	34.7	2.8	9.3	30.2
Corporate tax policies	2.7	20.8	50.0	2.8	27.9	44.2
Environmental regulations related directly to plant	2.5	5.6	45.8	2.8	16.3	27.9
Payroll taxes	2.3	15.3	70.8	2.4	16.3	60.5
Electricity costs	2.0	13.9	79.2	2.4	20.9	69.8

Note: Respondents were asked to indicate on a five-point scale the degree to which various public policies inhibit or contribute to the success of their plant (1 = *strongly inhibits*, 2 = *inhibits*, 3 = *neither inhibits nor contributes*, 4 = *contributes*, 5 = *strongly contributes*). R&D = research and development.
Source: Survey data

Table 5: Plant Managers' Assessment of the Degree to Which Selected Public Policies Inhibit or Contribute to Plant Success: SMEs versus Large Plants

	SMEs (≤250 Employees; n = 82)			Large Plants (>250 employees; n = 31)		
Public Policy Measure	Average (Out of 5)	% Contributes (>3)	% Inhibits (<3)	Average (Out of 5)	% Contributes (>3)	% Inhibits (<3)
Subsidies and/or tax credits for R&D	3.8	66.7	3.7	3.9	74.2	6.5
Programs to retain or attract vehicle assembly capacity	3.7	62.5	8.8	3.9	67.7	9.7
International trade agreements	3.5	59.3	16.0	3.6	51.6	12.9
Support for workforce training	3.5	51.9	6.2	3.4	48.4	6.5
Investments in local public services	3.3	38.3	7.4	3.4	45.2	6.5
Road and rail infrastructure	3.3	32.1	3.7	3.5	45.2	3.2
Export development programs	3.3	31.6	6.3	3.2	29.0	12.9
Vehicle emission and fuel economy regulations	3.2	22.2	8.6	3.5	38.7	0.0
Federal fiscal policy	3.1	40.0	35.0	3.5	58.1	19.4
Legal requirements related to closure and layoffs	2.6	6.2	40.7	3.0	16.1	16.1
Corporate tax policies	2.6	19.5	55.8	3.0	38.7	38.7
Environmental regulations related directly to plant	2.5	6.2	45.7	2.9	19.4	25.8
Payroll taxes	2.1	11.3	75.0	2.8	29.0	54.8
Electricity costs	2.1	14.8	81.5	2.3	22.6	67.7

Note: Respondents were asked to indicate on a five-point scale the degree to which various public policies inhibit or contribute to the success of their plant (1 = *strongly inhibits*, 2 = *inhibits*, 3 = *neither inhibits nor contributes*, 4 = *contributes*, 5 = *strongly contributes*). R&D = research and development; SME = small- or medium-sized enterprises
Source: Survey data

Table 6: Public Policy Issues Mentioned in Open-Ended Question Responses.

Issue	No. of Mentions (%)
Incentives for assembly plants	25 (36)
High cost of electricity	22 (32)
Cost of regulatory compliance	18 (27)
Corporate taxes and payroll taxes	14 (21)
Training and skill development	14 (21)
Wages and labour costs	11 (16)
Unions and right to work	10 (15)
Innovation policy	10 (15)
Manufacturing strategy	8 (12)
Other issues	22 (32)

Source: Survey data

of the comments regarding regulatory compliance also referenced the perceived negative role of unions:

> The costs of having a union are deteriorating margins throughout the region. The union supports illegitimate WSIB [Workplace Safety and Insurance Board] claims and [the union] has staff that file appeals on the employee's behalf and company's legal fees rise. Wages are patterned against your competitors, so no room to be competitive. Unions tie your hands to increase productivity by bargaining fixed breaks and lunches. Too many [Employment Standards Act] days where the company has to back fill with overtime. Now the government wants to charge 2 percent on a new pension plan? Electrical costs, WSIB costs, payroll taxes are out of control. (manager, medium-sized, European-owned parts plant)

> [We] … need to support an "open for business" strategy with tax relief, utilities cost reduction, reduction in cost of administration of government-mandated business policy. Need to reduce cost of utilities and costs of doing business in Canada. (manager, large, Canadian-owned stamping plant)

The availability of subsidies, tax credits, or both for R&D; provision of government subsidies to attract or retain OEM vehicle assembly capacity in Ontario; international trade agreements; and government support for workforce training and skills upgrading were the four most highly ranked factors contributing to firm success. Because the Canadian auto parts industry is so heavily reliant on exports to the United States, it was not surprising that most respondents stated that the value of the Canadian dollar has a significant impact on plant competitiveness.[14]

Incentives to attract OEM assembly capacity were the single most mentioned factor in the open-ended comments section (Table 6). Many of these comments, however, emphasized the current inadequacy of Canadian incentives compared with those of competing US jurisdictions:

> Government needs to create incentive programs far superior to other locations. States brag about how they attract firms to locate in work areas. Kentucky is a great example. They supplied the infrastructure to locate Toyota while creating a community who has a "ROI" far greater than what was spent. Government needs educated leaders who know how business functions. (manager, small, Canadian-owned engine parts plant)

> We need to take manufacturing seriously and seal a deal with a new OEM to build vehicles in Canada. Mexico is a growing threat with opportunities for highly skilled Canadians to move to Mexico to capitalize on opportunities. We need to be more competitive. (manager, large, European-owned seating plant)

In previous research (Rutherford and Holmes 2008b), we found that R&D subsidies and tax credits, and especially the federal SR&ED program, are crucially important to the incremental innovation strategies pursued by many automotive parts firms in Canada. Yet although our survey confirmed this (see Table 3), even managers in larger plants felt that such programs did not fully compensate for how OEMs squeezed them on product development costs:

> We struggle often with new product development costs as many of our current or potential customers do not want to pay for the development. This development can be lengthy—over several years, and at a large cost to a supplier such as ourselves. We do take advantage of SR&ED, but we can only use so much production capacity for trials etc. that are not covered by the customers. (manager, large, US-owned transmission parts plant)

On a different question, respondents indicated on a five-point scale their degree of agreement or disagreement with a series of statements regarding conditions within their local region that might enhance the competitiveness of the automotive industry (see Tables 7, 8, and 9). Of particular relevance to the analysis reported in this article were statements regarding local university support for R&D, local community college support for workforce training programs, and local government policies. In general, responses were fairly neutral with regard to the statement regarding university support for R&D. However, whereas almost half of the respondents agreed with the statement that "local colleges offer training programs geared to the needs of the automotive parts industry," a similar proportion disagreed that "local government policies contribute positively to the automotive parts industry in the community" (Table 7).[15]

When results are disaggregated by plant ownership and by plant size, some interesting differences emerge. On average, Canadian-owned plants employed fewer employees than their foreign-owned counterparts—187 and 274, respectively. Canadian-owned plants were also less likely to be a Tier 1 supplier (51.4 percent compared with 72 percent of non–Canadian-owned plants) and

Table 7: Plant Managers' Response to Statements Regarding Regional Institutional Factors: All Respondents

	All Respondents (n = 115)		
Regional Institutional Factor	Average (Out of 5)	% Agree (>3)	% Disagree (<3)
Local government policies contribute to the success of the industry	2.5	14.8	46.1
Universities provide necessary research and R&D support	3.1	28.7	20.9
Colleges offer training targeted to the needs of the local industry	3.1	44.3	25.2

Note: Respondents were asked to indicate on a 5-point scale the degree to which they agreed with several statements about their local region (1 = *strongly disagree*, 2 = *disagree*, 3 = *neither disagree or agree*, 4 = *agree*, 5 = *strongly agree*). R&D = research and development.
Source: Survey data

Table 8: Plant Managers' Response to Statements Regarding Regional Institutional Factors: Canadian-Owned versus Foreign-Owned Plants

	Canadian-Owned Plants (n = 72)			Foreign-Owned Plants (n = 43)		
Regional Institutional Factor	Average (Out of 5)	% Agree (>3)	% Disagree (<3)	Average (Out of 5)	% Agree (>3)	% Disagree (<3)
Local government policies contribute to the success of the industry	2.5	13.9	48.6	2.6	16.3	41.9
Universities provide necessary research and R&D support	3.0	23.6	23.6	3.2	37.2	16.3
Colleges offer training targeted to the needs of the local industry	3.1	44.4	29.2	3.2	44.2	18.6

Note: Respondents were asked to indicate on a 5-point scale the degree to which they agreed with several statements about their local region (1 = *strongly disagree*, 2 = *disagree*, 3 = *neither disagree or agree*, 4 = *agree*, 5 = *strongly agree*). R&D = research and development.
Source: Survey data

Table 9: Assessment Plant Managers' Response to Statements Regarding Regional Institutional Factors: SMEs versus Large Plants

	SMEs (≤250 employees; n = 82)			Large Plants (>250 employees; n = 31)		
Regional Institutional Factor	Average (Out of 5)	% Agree (>3)	% Disagree (<3)	Average (Out of 5)	% Agree (>3)	% Disagree (<3)
Local government policies contribute to the success of the industry	2.6	15.0	21.3	2.4	16.1	54.8
Universities provide necessary research and R&D support	3.0	28.4	22.2	3.1	32.3	19.4
Colleges offer training targeted to the needs of the local industry	3.1	42.0	25.9	3.3	54.8	25.8

Note: Respondents were asked to indicate on a 5-point scale the degree to which they agreed with several statements about their local region (1 = *strongly disagree*, 2 = *disagree*, 3 = *neither disagree or agree*, 4 = *agree*, 5 = *strongly agree*). R&D = research and development; SMEs = small- and medium-sized enterprises.
Source: Survey data

more likely to operate as either a Tier 2 supplier (88.8 vs. 60.4 percent) or an even lower tier supplier (57 percent vs. 25.6 percent).[16] Canadian-owned plants reported that it was difficult for them to compete in the US market if the Canadian dollar rose above US$0.93; the equivalent number for foreign-owned plants was US$0.87.

A large proportion of both Canadian- and foreign-owned plants (63.9 percent and 58.1 percent, respectively) viewed government incentives to attract or retain OEM assembly capacity as contributing or strongly contributing to the success of their firm (Table 4). However, Canadian-owned plants were more likely to view R&D subsidies and tax credits (72.2 percent vs. 58.1 percent), government support for workforce training (55.6 percent vs. 39.5 percent), and export development programs (33.3 percent vs. 23.3 percent) as important contributors to their success.

A significant majority of respondents viewed local government policies as inhibiting rather than contributing to their operations (46.1 percent vs. 14.8 percent) but were more positive concerning university contributions to R&D and especially the training programs of local colleges (Table 7). On average, managers of foreign-owned plants agreed slightly more frequently than managers

of Canadian-owned plants that local government policies, the availability of R&D collaborations with universities, and community colleges for skills training development made a positive contribution to the automotive industry in the region (see Table 8). One manager at a Canadian-owned plant commented that higher education institutions are unable to respond quickly to firm training needs:

> Industry needs more skilled labour training availability that cannot be satisfied by the colleges and university because the courses/programs take so long to get started. More skilled labour is needed—also need to get past the negativity of this being an unstable employment opportunity and turn it into a great career choice. (manager, small, Canadian-owned automotive tooling plant)

We also grouped plants by size; plants employing up to 250 workers (SMEs) represented 72.6 percent of our returns, with the remaining 27.4 percent being plants with more than 250 employees (large plants).[17] Larger plants were much more likely than SMEs to be dedicated Tier 1 suppliers. Although a significant majority of all surveyed plants considered that R&D subsidies and tax credits, such as the federal SR&ED program, had a positive impact on their competitive position, this was especially true of large plants. Programs to retain or expand vehicle assembly capacity in Canada and international trade agreements were both viewed as contributing to plant success by groups of both size. One very striking result was that managers of SME plants felt very strongly that federal fiscal policy, payroll taxes, electricity costs, and legal requirements around plant layoffs and closures inhibited their plant's success (Table 5). With regard to regional institutional factors, managers of large firms were far more likely to disagree than those in SMEs that local government policies contributed to the success of the industry (54.8 percent vs. 21.3 percent), but were more likely to agree with the statements regarding university R&D support and community college training programs (see Table 9).

Of the 82 SME plants that responded to our survey, 17 (or 21 percent) were manufacturers of tooling for the automotive industry. Firms that supply tools, dies, moulds, and machinery (usually referred to as TDMM) to the automotive industry constitute an important but often overlooked segment of the automotive industry in Canada. Automotive TDMM in Canada is dominated by relatively small Canadian-owned plants that employ highly skilled workers and enjoy a world-class reputation for their ability to design and build complex and sophisticated tools, especially moulds used in the production of plastic parts (Holmes, Rutherford, and Fitzgibbon 2005). All but 1 of the tooling plants that responded to our survey were Canadian owned, all were SMEs with an average of 75 employees, and they primarily supplied tooling to Tier 1 and lower tier parts manufacturers, with only 20 percent also supplying tooling directly to OEM assembly plants.

Given the size of their plants, TDMM plant managers' assessment of the influence that various public policy measures play in the success of their plant mirrored, not surprisingly, the results reported earlier for SME plants in general. TDMM plant managers, however, were even more likely than the managers of SME plants taken as a whole to consider payroll taxes, corporate taxes, electricity costs, and environmental regulations governing plant operations as inhibitors to plant success. Although they were more positive regarding government support for workforce training, they were less positive than SME automotive parts manufacturers in their assessment of the degree to which either government incentives to attract OEM assemblers or international trade agreements contribute to the success of their plant. This probably reflects the fact that they are less directly dependent on the OEMs as customers. In assessing the local region in which their plant was situated, TDMM plant managers were more likely than other respondents to have a less favourable assessment of the availability of technical skills and a strong work ethic in the local labour market.

Some of the preceding findings confirm findings from our previous research, which revealed that smaller parts firms are less able than OEMs or larger foreign-owned Tier 1 suppliers to engage with universities on R&D projects (Rutherford and Holmes 2008b). Yet our survey showed that the differences by plant size of the contribution made by university support for R&D were narrow (see Table 9), so plant size may not be the determining factor. The TDMM plants—most of which are small and Canadian owned—placed greater importance on R&D than either Canadian- or foreign-owned parts plants and were more likely to recognize the importance of local universities and colleges. Many Canadian-owned parts plants are oriented toward the production of less R&D-intensive products. Elsewhere in the survey, many reported that the intense pressure to meet customers' production demands meant that they had to remain focused on current production and had neither the time nor the available personnel to engage in formal R&D activities at the plant level.

In general, our survey results confirm those of previous studies on the role of public policy in shaping the Canadian automotive parts industry. Indirect policies, such as the impact of monetary policies on the value of the Canadian dollar, international trade agreements, road and rail infrastructure, and the quality of local public education and health care, were viewed as having a positive influence on plant-level success. Canadian-owned TDMM plants emerged as being the least dependent on a low exchange rate with the United States. This is probably related to the fact that tooling is a high-value–added product and one for which quality and

design innovation rather than part price are the key to competitive success. Smaller plants reported that corporate and payroll taxes, regulatory compliance, and electricity costs had a strong inhibiting influence on their success.

However, the managers' comments conveyed a strong sense that the Canadian automotive industry stands at a critical cross-roads (see Table 6). For many respondents, the challenging competitive conditions experienced since the 2008–2009 crisis are not simply cyclical but rather represent a significant structural shift within the industry that threatens Canadian-based producers:

> The automotive industry is moving away from Ontario—to the southern USA and Mexico. Government is doing nothing to stop this trend.... There is not going to be an automotive industry in Canada if measures are not taken. (manager, medium-sized, US-owned stamping plant)

Indeed, many respondents viewed the decline in the industry over the past decade as directly related to Canadian public policy. In particular, they were highly critical of recent federal government–negotiated free-trade agreements and the negative impact on parts suppliers of the perceived policy vacuum left by the ending of the Auto Pact:

> Stop free trade agreements with off-shore countries: e.g. South Korea we lost a long-standing order (since 1993) to South Korea. What is going to come back to Canada for processing? (manager, small, Canadian-owned automotive parts plant)
>
> Adjust import taxes of automotive assemblers from foreign countries. Protect North American auto makers—offer tax incentives to attract manufacturing and assembly companies as is being done in U.S. states. (manager, medium-sized, US-owned seating plant)
>
> Canada needs to stop losing jobs to US and Mexico and bring back the Auto Pact signed in 1965.... Something in the way of tariffs need to be put on goods coming from China so we start producing in Canada once more. GM, Ford, and Chrysler are sending their tools to China to be built, and it has killed the tooling industry in North America. This is probably a pipe dream but something has to be done to stop the bleeding or we will have no manufacturing left in Canada. (manager, small, Canadian-owned automotive tooling plant)

Besides reformed trade policies, the managers' comments also underlined the need for both greater collaborative initiatives within the industry and more direct government support within a strong overall Canadian manufacturing policy:

> There has been no new ground broken for a Canadian assembly plant since the Woodstock Toyota operation. Our governments have been AWOL in developing a manufacturing strategy. (manager, large, Canadian-owned die-casting plant)
>
> [We need a] unified strategy and action plan among all stakeholders: OEMs, part suppliers, government, labour unions, and educational institutions, for how to compete globally. (manager, large, Japanese-owned seating plant)
>
> [We] need to collectively collaborate to bring more pressure from industry, government, and labour on OEMs to make more investment in Canada. Need to structure and support relationships between industry and universities and community colleges. Need national policy to reflect support and vision of industry and manufacturing in Canada. Need to learn from other successful national business models on how to build a strong manufacturing base. (manager, large, Canadian-owned stamping plant)

Furthermore, some argued that in any new manufacturing strategy, greater spending must be tied to assisting firms in moving to higher value production:

> [Capacity expansion]—give grants to companies that expand footprint, employ new technology/equipment. Basically free money; however, that footprint or equipment cannot be sold or moved for a minimum 10 years and must be in service. (manager, medium-sized, US-owned stamping plant)
>
> To attract higher margin work, we need to have expensive high-efficiency equipment. The government needs to grant long-term loans with no interest to help buy the high-tech equipment that will bring in higher margin work. (manager, medium-sized, Canadian-owned stamping plant)

In summary, the survey results make it clear that although plant managers recognize and support the need for a public policy presence in the automotive industry, only some public policies are viewed favourably—specifically, those related to R&D and location incentives to attract new assembly investment.

Conclusions

In the wake of the restructuring that occurred after the 2008–2009 crisis, the role of public policy in shaping the automotive industry has, if anything, increased in importance for the plant managers who responded to our survey. In some instances, the impact of public policies and regulations is perceived to have been negative. For example, many managers considered that Canadian trade policy has exposed them to unfair competition, especially from Mexico and Asia. They also noted the increasing competitive challenges imposed by the rising price of government-regulated utilities and the costs incurred in complying with environmental, employment, and labour market regulations.

Our survey results also reflect recognition of the importance of federal and provincial R&D subsidies, the need for incentives to expand OEM assembly capacity in Canada, and the role played by universities and colleges in support of R&D and training strategies. The

SR&ED and other R&D-related programs have long been recognized as providing a competitive advantage to Canadian-based producers. Yet some respondents noted that, for a variety of reasons, many smaller plants are unable to access such support. Consequently, many of the benefits of federally funded programs that support industry-driven university-based research, such as the Auto21 and APC programs, have accrued to larger global suppliers and OEMs.

Furthermore, not only does formal R&D in the Canadian auto industry remain limited, in part because of high levels of foreign ownership (Council of Canadian Academies 2013, xii), but the Canadian automotive parts industry also lacks the institutional and policy support needed to actually transform new technology into new products (Rutherford and Holmes 2013b). Although SR&ED and other programs are useful in covering some R&D costs, they do little to overcome the significant technological and training challenges involved in technology transfer (Council of Canadian Academies 2013). There have been relatively few systematic policy initiatives aimed at facilitating technology transfer to SMEs through the kind of strong institutional support that exists in Germany, Japan, and even the United States and Mexico (Britton 1993; Galvin, Goracinova, and Wolfe 2014). Most automotive R&D is performed not in Canada but elsewhere in the corporate value chains of global automotive suppliers. Thus, a critical question is whether public policy should focus more on support of technology transfer and adoption.

Federal and Ontario government policy toward the automotive parts industry generally conforms to Smardon's (2014) arguments regarding the Glassco framework. With the notable exceptions of the Auto Pact; the 1980s duty remission programs; and the PSIP, AIF, and OAIS in the 2000s, for at least the past half-century government policy has largely responded to, rather than actively shaped, markets, both sectorally and at the firm and plant level.

Many managers commented on taxes, the cost of regulatory compliance, and what they perceived to be the current automotive policy vacuum in Canada. They underlined the need for (a) reductions in the costs of electricity, payroll taxes, and regulatory compliance; (b) a comprehensive and fair-trade policy that makes offshoring less attractive and encourages greater OEM and parts production in Canada; (c) greater incentives that are competitive with those offered by other North American jurisdictions to attract OEM investment; and (d) greater direct assistance to Canadian-based suppliers to adopt new technology and generally upgrade their competitive position.

Arguably, the sensitivity to unions, labour costs, and costs associated with regulatory compliance revealed in survey responses are, in part, a by-product of the lack of a strong Canadian manufacturing policy oriented toward fostering innovation, technology transfer, and collaborative relations among firms, governments, and labour. Low levels of domestic R&D capacity and technological upgrading push firms to a reliance on cost-based competition focused on constraining overall labour costs. The federal and Ontario governments have used direct subsidies to attract and retain OEM assembly capacity as a way to also support demand for the automotive parts industry. However, Ontario competes directly with US and Mexican jurisdictions, which not only enjoy lower labour and energy costs but are also willing to commit even larger incentives to attract or retain OEM capacity. Given the challenges currently confronting the industry, it is clear that Canada will need to significantly rethink its automotive policy if it is to maintain or increase its share of North American automotive production.

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Notes

1 Even after the Canada–US free-trade agreement and North American Free-Trade Agreement, there continued to be an incentive for the so-called Detroit-3 (D-3; General Motors [GM], Ford, and Chrysler) to continue to meet their Auto Pact commitments. By doing so, they could import automotive products duty free from countries outside North America because Canada had always viewed the Auto Pact as applying in a multilateral context rather than as a strictly bilateral Canada–United States arrangement as the United States did. This led to tensions as the North American presence of Japanese and European automakers grew. Eventually, Japan and the European Union successfully challenged and overturned the Auto Pact before the World Trade Organization (Anastakis 2001).

2 The survey covered a range of issues related to innovation and competitive strategy. In this article, we focus on findings related to the influence of public policies in shaping plant-level competitive strategies.

3 Others have estimated employment in the automotive parts industry to be as high as 95,000 (see Sweeney and Mordue 2017)

4 A report published in early 2016, however, notes that although until recently Canadian auto parts employment lagged that of the United States, Canadian suppliers have outperformed since mid-2015 as a result of record North American vehicle demand and a 28 percent decline in the value of the Canadian dollar since 2011 (Gomes 2016)

5 This represents a dramatic shift form 1999 when Japanese OEMs produced just 16.7 percent of the vehicles built in Canada.

6 This strategy led to trade friction with the United States. Subsequently, the Canada–US Free-Trade Agreement and the North American Free-Trade Agreement prevented companies other than those who had qualified in 1965 (plus Canadian Automotive Manufacturing Inc.) from acquiring Auto Pact producer status and established a timetable for the phasing out of the Duty Remission Orders. Canada, however, continued to interpret the Auto Pact as allowing qualified producers (essentially the D-3) to import parts from third countries duty free. Ultimately, this led to a challenge brought before the World Trade Organization by Europe and Japan, and the Auto Pact was finally struck down in 2001 (Holmes 2004).

7 Over the past 10 years, the Canadian dollar has traded as low as US$0.69 and as high as US$1.09.

8 Several industry stakeholders who favour grants over repayable loans highlight the repayable loan aspect of federal government programs such as PSIP and AIF as an issue in debates over Canada's ability to compete with automotive investment incentives offered by jurisdictions in the United States.

9 The SR&ED program is designed "to encourage Canadian businesses of all sizes and in all sectors to conduct research and development (R&D) in Canada that will lead to new, improved, or technologically advanced products or processes.... Claimants can apply for SR&ED investment tax credits for expenditures such as wages, materials, machinery, equipment, some overhead, and SR&ED contracts" (Canada Revenue Agency 2016).

10 APC defines *next-generation manufacturing* as developing manufacturing processes for mass reduction, cost reduction, and quality improvements and improving manufacturing flexibility and efficiency (Automotive Partnership Canada n.d.).

11 Our list was drawn from a database compiled by Dr. Brendan Sweeney that is considered to be the most comprehensive census of automotive plants in Canada currently available. Our survey was endorsed by both the Automotive Parts Manufacturers' Association, which included a description of the survey in its quarterly members' newsletter, and the Ontario Ministry of Economic Development, Employment and Infrastructure.

12 Although the vast majority of responding plant managers answered all the structured questions and well over half offered comments to the final open-ended question, a few surveys were only partially completed. Thus, in the following discussion of results, reported responses may not always sum to 115.

13 Only 17 of the plants that returned surveys are unionized.

14 When asked to indicate the point at which the value of the Canadian dollar makes it difficult to compete in US markets, estimates ranged from US$0.65 to US$1.10 with an average of US$0.92. During the time the survey was administered the Canadian dollar sat at between US$0.72 and US$0.75

15 Also, a significant number of respondents disagreed that "there is a good availability in the region of workers with a strong work ethic" or with "appropriate technical skills." The statement that "unions representing autoworkers are a significant positive factor in the local economy" elicited an overwhelmingly negative response.

16 Remember, many plants indicated that they played multiple roles within supply chains; a few even stated that they supplied directly to OEM assemblers, to Tier 1 suppliers, and to lower tier suppliers.

17 It should be noted that there is a relatively strong relationship between plant size and plant ownership, with Canadian-owned plants tending to make up a larger proportion of the small- to medium-sized plants compared with foreign-owned plants. Hence, the responses by plant size in general follow a similar pattern to those by plant ownership.

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