MACROECONOMIC IMPACTS OF CANADIAN IMMIGRATION: AN EMPIRICAL ANALYSIS USING THE FOCUS MODEL

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Table of Contents

INTRODUCTION 1

LITERATURE ON IMPACT OF IMMIGRATION ON DOMESTIC ECONOMY 3

Theoretically Expected Impact 3

Evidence on Impact on Domestic Labour Market 5

Evidence on Use of Transfer Programs 7

Evidence on Impact on Use of Domestic Health Services 9

Evidence on Impact on Net Fiscal Balance 9

Overall Summary of Micro-Evidence on Impact on Domestic Economy 11

THE FOCUS MACROECONOMETRIC MODEL 12

TECHNICAL ISSUES, ASSUMPTIONS AND RELATED ADJUSTMENTS 12

Base Case 13

The 'Shock' or Experiment 13

Additional Model Changes or Adjustments 14

Participation Rates 14
Full-Employment Unemployment Rate 14
Government Spending 15
Remittances and Funds Brought by Immigrants 16
Wages and GDP Impact of Immigrants vs. Domestic Workers 17

SIMULATION RESULTS 18

SUMMARY AND POLICY DISCUSSION 21

REFERENCES AND WORKS CITED 26

TABLES 35

MACROECONOMIC IMPACTS OF CANADIAN IMMIGRATION: AN EMPIRICAL ANALYSIS USING THE FOCUS MODEL

INTRODUCTION

Canada is a nation of immigrants. As such, it is not surprising that there is considerable interest in how immigrants fare in the Canadian labour market as well as the impact they have on the Canadian labour market and the macro economy in general. The latter dimension – the impact on the macro economy is the focus of this paper. The main outcomes of interest include: real GDP and GDP per capita; unemployment; aggregate demand and especially for housing; investment; productivity; and government expenditures, taxes and net government balances.

With respect to the dimension of how immigrants themselves fare in the Canadian labour market, the literature is in (unusual) virtual agreement that immigrants are having problems economically assimilating or integrating into the Canadian labour market in the sense of catching up to the earnings of domestic-born workers who otherwise have similar wage determining characteristics. Importantly, the problem is getting worse in the sense that the assimilation is slower for the more recent cohorts of immigrants who may never expect to fully catch up to the earnings of comparable domestic-born workers.[1]

In part for this reason, the proportion of recent immigrants (in Canada for 5 years or less) who were in poverty (defined as falling below the Statistics Canada Low-Income cutoff) increased from 24.6% in 1980 to 34.2% in 1985 to 31.3% in 1990 to an astonishing 47% in 1995, falling to 35.8% in 2000 and 36% by 2005 (Picot and Sweetman, 2005, p. 11; Picot, Lu and Hou 2010, p. 14).[2] This increase in the poverty rate of immigrants was occurring at the same time as poverty rates for the non-immigrant population were generally falling.

Hatfield (2004) identified recent immigrants, as one of the five groups most likely to be in persistent poverty in Canada, defined as having a cumulative income of the economic family over the period that falls short of the cumulative amount of that family's post-transfer, post-income tax low-income cutoff. The percentage of each group that was likely to have persistent low-income over the period 1996-2001was:

[1] Studies that document and/or review the literature on the declining economic position of immigrants into Canada include Bloom and Gunderson (1991), Baker and Benjamin (1994), Bloom, Gunderson and Grenier (1995), Grant (1999), Frenette and Morisette (2003), Hum and Simpson (2004), Warman and Warswick (2004), Aydemir and Skuterud (2005), Picot and Sweetman (2005), Hiebert (2006), Reitz (2006, 2007a, 2007b), Zietsma (2007), Ferrer and Riddell (2008) and Tu (2010).

[2] More detailed information on the poverty of recent immigrants to Canada is given in Fleury (2007) and references cited therein.

- unattached individuals age 45-64 (29.2%),
- disabled persons (26.1%),
- recent immigrants (25.6%),
- lone parents (21.8%),
- and Aboriginals living off-reserve (15.7%).[3]

These compared to an average of 3.4% for the non-risk groups (Hatfield 2004, p. 19).

Hatfield (2004, p. 22) identified that not having attachment to paid work as the single most important determinant of persistent low income, with the low-income rate being three to six times higher for those who had no paid work. The importance of labour market earnings is also emphasized in Fleury (2007, p. 43): "having a paid job, accumulating many hours of work, and being part of a family with many potential earners are all characteristics that help recent immigrants avoid poverty." This highlights the importance of economic integration into the labour market for immigrants.

This slower labour market assimilation and increasing poverty is a tinderbox that can ultimately disrupt into actions of social discontent. This is the case especially since immigrants have expressed concern that they have been attracted into Canada by an immigration policy that gives points for skills and education but such credentials are often not recognized (Bauder 2003; Grant 2005b; Grant and Nadin 2007, and Wald and Fang 2008).

The tinderbox of potential concerns on the part of immigrants from their lack of economic assimilation could turn into an inferno if it were also accompanied by negative reactions on the part of domestic-born Canadians if immigrants were having a negative impact on the labour market for domestic-born workers or on the macro-economy in general. The purpose of this paper is to examine whether there is such a negative effect.

The paper begins with a discussion of the theoretically expected impact of immigration on various dimensions of the domestic economy. This is followed by an illustrative review of the literature on the impact of immigration on various dimensions: domestic labour markets; the use of transfer programs; the use of health services; and net fiscal balances involving the difference between expenditures and taxes. This is followed by a description of the FOCUS macro-econometric forecasting model used to estimate the effects of immigration on the macro-economy. Simulation results are presented next. The paper concludes with a summary and discussion of the policy implications.

[3] Information was not available in the data set for Aboriginal persons living on-reserve. If they were included, the poverty rate for Aboriginal persons would be even higher.

LITERATURE ON IMPACT OF IMMIGRATION ON DOMESTIC ECONOMY

Theoretically Expected Impact

In theory, immigration can have a complex impact on various dimensions of the domestic labour market, including wages, employment, labour force participation and unemployment.[4]

The supply influx of immigrants can obviously lower domestic *wages* as they compete with domestic workers for the jobs. This effect is likely to be greatest for domestic workers who are close substitutes for immigrants. As such, if the immigration is of low-skilled workers then the wages of low-skilled domestic workers should fall (in relative terms at least) and the wages of higher skilled workers may rise if they are complements to the less skilled workers. If the immigration is of high-skilled workers (as is generally the case in Canada), and if their skills are recognized and utilized, then the wages of high-skilled domestic workers should fall and the wages of lower skilled workers may rise if they are complements to the more skilled workers. To the extent that new immigrants are potential substitutes for earlier immigrants who came into the country earlier, then the wages of the earlier immigrants are more likely to fall.

The effect on the *employment* of domestic-born workers will follow the same pattern as that of wages. That is domestic workers are more likely to be displaced if they are close substitutes for immigrants while their employment may increase if they are complements. The magnitude of the employment adjustment will depend in part on the degree to which domestic wages are flexible. If they are inflexible (as is often the case in European labour markets and in the short-run) then the brunt of the adjustment will occur on employment. If wages are flexible (as is more often the case in North America and in the long run) then the employment adjustments will be smaller.

Adjustment may also occur in the form of *labour force participation.* Domestic workers who compete for jobs that immigrants may occupy may drop out of the labour force altogether if they feel their chances of obtaining a job are reduced (i.e., a discouraged worker effect). In contrast some family members may enter the labour force to sustain family income if they feel that the jobs of other family members are in jeopardy (i.e., an added worker effect).

Unemployment of domestic-born persons can also be affected depending upon how the previously discussed adjustments play out. The unemployment of domestic-born workers will increase if they are of the skill type that competes with the immigrants and if wages are not flexible. Any increase in unemployment in turn can place downward pressure on domestic wages.

[4] The theoretically expected impacts of immigration are set out, for example, in Benjamin, Gunderson, Lemieux and Riddell (2007, pp. 333-338), Berry and Soligo (1969), Borjas (1994, 1995, 1999), Coppel, Dumont and Visco (2001), Friedberg and Hunt (1995), Hatton and Williamson (1993), Simon (1999) and Smith and Edmonston (1977).

But immigration can be associated with many other factors that can offset these generally potentially negative effects.[5] Because of their high skills due to the skills-based point system, and increased importance of Provincial Nominee Programs, immigrants may break skill shortages and production bottlenecks and this can expand the job opportunities for domestic-born workers. Immigrants obviously also increase aggregate demand, especially associated with housing but also with investment. The investment may come from immigrants themselves (especially the business class) as well as increased investment to take advantage of the complementary new immigrants. Over the long term, the impact of immigration on the industrial structure of regions can be substantial. For example, as noted by Richard Florida (2010, p. 58), the ability to attract international talent has "long been a defining characteristic of leading financial centers".

Importing people through immigration to domestically produce goods and services can be a substitute to importing such goods and services from other countries. It can also expand exports to the former source countries because of greater information flows and reduced transactions costs as immigrants are familiar with both their new host country and their former source country. In essence, immigration can foster increased productive economic activity with the former home country.[6]

Clearly, basic theoretical considerations highlight that immigration can have positive or negative or offsetting effects on domestic labour markets as well as on other dimensions such as aggregate demand, investment and trade. As is so often the case, it is necessary to appeal to the empirical evidence to determine the impact.

The same applies to the expected impact of immigration on government fiscal balances (expenditures including transfers less taxes). At times when the ageing population is expected to impose a heavy fiscal burden through age-related programs like pensions and health care, immigration is often looked upon as a possible way to mitigate that burden. As with the impact of immigration on the domestic labour market, the impact on the fiscal burden is theoretically indeterminate. Immigrants will obviously use government services like education and health care, and they can receive transfers like employment insurance, social assistance and public pensions. But they obviously also pay taxes in various forms. As well, by adding to the population size, immigration can facilitate the sharing or spreading of the cost of public goods that are not diminished by additional users (e.g., national defense) as well as achieving economies of scale in public services (assuming such economies exist). Immigration can also alter the age distribution of the population in a way that yields relatively more taxes and fewer public expenditures.

Given these various forces working in different directions, the impact of immigration on government fiscal balances will depend upon whether they will pay into

[5] Many of these channels whereby immigrants can affect domestic labour markets are outlined in Sweetman (2005) and Sweetman and Warman (2008).

[6] This productive interaction with their former source country is emphasized, for example, in Baker and Benjamin (1997), Globerman (1995), Kuhn and Wooton (1991) and Head and Ries (1998).

the system more than they will take out. As will be illustrated later when the evidence is discussed, this will depend upon such factors as their age, education and skill level. Again, it is necessary to appeal to the empirical evidence.

Evidence on Impact on Domestic Labour Market

With respect to the impact of immigration on domestic labour markets, the international evidence is mixed although most studies tend to show little or no effect. Estimating the impact of immigration is difficult, however, since immigration is seldom exogenous; that is, immigrants likely come to countries and locations where the economy is growing. As well, immigration may induce an exit of domestic workers if they find their job opportunities are negatively affected by immigrants. Many of the studies in the literature, however, deal with these issues.

The most comprehensive review of the literature involves a meta-analysis of the international literature on the impact of immigration on domestic labour markets (Longhi, Nijkamp and Poot 2008). Their meta-analysis involved 45 studies that provided 1,572 effect sizes: 854 on the impact on wages; 500 on employment; 185 on unemployment; and 33 on labour force participation. Of the 1572 effect sizes 905 were from the U.S., 422 from eight European countries (Austria, France, Germany, Netherlands, Norway, Portugal, Spain and the UK); and 177 from three other countries (Australia, Canada and Israel). The effects from Canada were from three studies: Akbari and Devortz (1992), Gross (2004) and Aydemir and Borjas (2006). All effects were measured by the common metric of the t-statistic. The impact on domestic workers is considered to be positive if the t-statistic is positive and statistically significant, it is considered to be negative if the t-statistic is negative and statistically significant, and it is inconclusive if the t-statistic is statistically insignificant. Four outcomes are utilized: wages, employment, labour force participation and unemployment. Their t-statistic on the unemployment measure is reversed so that a positive coefficient is evidence of a positive or desirable effect on domestic-born workers.

Their meta-analysis results give rise to the following generalizations:

- Most (58%) of the estimates across the four outcomes are statistically insignificant at the five percent level implying *no effect*, about 25% show a statistically significant *negative* impact while about 17% show a statistically significant *positive* impact on domestic workers (p. 10). In essence, most studies (58%) find no impact, while the number of impacts that are negative are slightly larger (25%) than the number that are positive (17%).
- The biggest difference across the four different outcomes is with respect to unemployment where 82% showed no effect, 12% a negative effect and 6% a positive effects. This suggests that the adjustments that occurred in the other dimensions (e.g., wages and labour force participation) were such that unemployment was largely unaffected.

- The impacts are smaller in smaller geographic areas and local labour markets which are more open to other mechanisms of adjustment such as trade, internal migration and capital mobility so that domestic-born persons can "escape" potentially harmful effects through out-migration, capital inflows or additional local demand.
- The negative impacts are larger for previous immigrants who are likely to be substitutes for new immigrants.
- The negative impacts are smaller for high-skilled domestic-born workers reflecting the fact that they are the least likely to be substitutes for immigrants who tend to be low-skilled in most countries. (As indicated subsequently, this is not the case for Canada where immigrants tend to be highly skilled in part because of the point system.)
- The extent to which the results are different depending upon the quality of the study is mixed. Negative effects tend to be less often found in studies that can be considered of high quality because they have the advantage of being able to use pooled data or they are more recent studies and hence likely use better data and methodologies or they are based on "natural experiments" involving exogenous increases in immigration or other more rigorous methodologies. However, negative effects are slightly more often found in studies published in journal articles that have the quality control of peer review.
- They find no evidence that publication bias is important in this literature.
- Overall, they conclude (p. 24): "The impact of immigration on the labour market of the native born population is quantitatively very small."

The following are some specific illustrative examples with more detail from the literature on the impact of immigration on domestic labour markets, many of which are used in the above meta-analysis.

Based on U.S. data, little or no adverse effect on the wages and employment of domestic workers is found in Altonji and Card (1991), Butcher and Card (1991), Card (1990, 2001, 2005), Card and Dinardo (2000) and Lalonde and Topel (1991), while the supply influx of immigrants is found to have negative effects on domestic worker wages and employment in Borjas (2003) and Borjas, Freeman and Katz (1996, 1997).

Based on Australian data, little or no effects on domestic labour markets are found in Chang (2004) while small positive and insignificant effects are found in Addison and Worswick (2002). Little or no effects are also found for New Zealand (Mare and Stillman 2009). For France, positive effects are found in Gross (2002) while Hunt (1992) finds little or no effect on the domestic labour market from the large return migration of Europeans to France after Algerian independence. Carrington and de Lima (1996) find little or no effect on the Portugese labour market associated with the large return-migration of Portugese after independence in many of their former colonies. Similarly, Friedberg (2001) finds little or no effect on the Israeli labour market of the large influx of Russian Jews in the early 1990s. Winter-Ebmer and Zweimuller (1996) find positive effects for Austria.

The limited number of Canadian studies tend to find no negative effect of immigration on the domestic labour market.[7] An exception is Aydemir and Borjas (2006) who find a negative effect over the period 1971-2001. Interestingly they find that immigration increases wage inequality in the US (because their emphasis on family re-unification implies less-skilled immigrants) but reduces it in Canada (because the skills-based emphasis implies high- skilled immigrants).

Overall, the international evidence on the impact of immigration on the domestic labour market tends to be mixed, although a simple score-card count would show most studies finding little or no impact, a few finding a positive impact and a few a negative impact. Certainly, the evidence does not show an overwhelming negative impact. This is also the case for Canada, although the evidence is not uniformly in agreement.

Evidence on Use of Transfer Programs

Based on Survey of Consumer Finance (SCF) data for Canada for the years 1985 and 1990, Baker and Benjamin (1995a, 1995b) find that immigrants receive fewer transfer payments in the form of unemployment insurance (UI) and social assistance (SA) than do the native born. This prevails in the raw data and generally after controlling for a number of observable characteristics. Furthermore, the differences are even greater when one accounts for the poor labour market outcomes of immigrants because of their lack of economic assimilation which should lead them to greater receipt of transfers. They do find, however, that the gap is declining for more recent cohorts of immigrants likely because of their increasingly poor labour market outcomes. As well, they tend to access the programs more the longer they have lived in Canada and acquire eligibility for the programs, suggesting that they are assimilating more in this negative dimension of using transfer programs. Baker and Benjamin do find that immigrants are more likely to receive rent subsidies when they first enter, compared to native-born persons, but that this difference declines the longer that immigrants remain in Canada. Overall, Baker and Benjamin (1995a p. 671) conclude: "We find no evidence that immigrants pose an excess burden on Canada's transfer programs. They are less likely than natives to participate in the UI and SA programs upon entry to the country, although assimilation [years in Canada] brings higher participation. There is also evidence that more recent immigrant cohorts have higher participation rates [in transfer programs] than natives… Rent subsidization follows a different path on which initially higher rates of receipt among immigrants give way to lower rates with years in Canada."

Based on a larger number (13) SCFs over a longer time period (1981 – 1994) Crossley, McDonald and Worswick (2001) confirm that immigrants are less likely to use UI and SA than are native-born persons. However, they find no evidence that their usage

[7] Canadian evidence indicating no negative effect on the domestic labour market from immigration includes Akbari and Devoretz (1992), Grant (1998), Gross (2004), Marr and Syklos (1995) and Tu (2000). Gross finds that immigration increases unemployment in the short-run while adjustments occur but permanently reduces it in the long-run once the adjustment process has worked its way through the system.

is increasing for more recent cohorts of immigrants and mixed evidence as to whether immigrants are assimilating into using less of these programs the longer they stay in Canada.

DeSilva (1997) also finds that immigrants to Canada are less likely to use UI compared to the native-born. As well, he finds that immigrants are more likely to assimilate into using UI the longer they remain in the country, and that there is considerable heterogeneity across different ethnic groups.

For British Columbia, Lui-Gurr (1995) also finds that immigrants and native-born persons have the same likelihood of accessing SA and that this has not changed over different cohorts of immigrants. Understandably, however, refugees do have a higher probability of accessing SA.

A number of Canadian studies have used data sets that involve only immigrants, and they focus on the use of transfer programs by immigrants without making direct comparisons to non-immigrants. Siklos and Marr (1998a, 1998b) find that immigrant usage of unemployment insurance obviously increased during recessions as well as when UI became more generous, and they are higher for immigrants who have less education and little knowledge of English or French. Use of UI is also higher amongst immigrants from Asia and South America perhaps because of the greater importance of family class immigrants who may not have labour market skills. Langlois and Dougherty (1997) document that family class immigrants had the highest usage of UI shortly after arriving, while those in the refugee class (who could not work immediately after arriving) had the highest long-term usage. Marr and Siklos (1999, 2001) further document that, not surprisingly, use of UI varied considerably by class of immigrant. In descending order from high to low usage these classes were: refugees, family class, assisted relatives, skilled workers and business class. They also document a rising trend over time in the usage of UI amongst all immigrant classes.

Overall, the Canadian evidence suggests that new immigrants tend to access transfer programs like unemployment insurance, social assistance and housing subsidies less than do domestic-born persons. The evidence is mixed as to whether they assimilate into using them more the longer they remain in Canada and whether more recent cohorts of immigrants tend to access such programs more often, although the more recent and comprehensive evidence suggests that these latter two effects do not occur. Not surprisingly, accessing of transfer programs by immigrants is higher for the less skilled and it varies by immigrant class in descending order from high to low usage being refugees, family class, assisted relatives, skilled workers and business class.

Comparisons with the U.S. are instructive since Canada has tended to follow a more skill-based immigration system while the U.S. has emphasized family reunification. Based on U.S. data, Blau (1984) find that after controlling for age, immigrants were considerably less likely to use SA than were native-born persons and only slightly more likely to use programs like UI. She also found that immigrants did not assimilate into using SA more the longer they remained in the country, but they did assimilate into using

more programs like UI as they built eligibility for them. Tienda and Jensen (1986) also find that immigrants were less likely to use SA than were native-born persons.

In contrast, based on updated pooled data that better enables estimating assimilation effects, Borjas (1994) finds that immigrants accessed SA more than natives, especially for refugees, and that this gap has widened for the more recent cohorts of immigrants. However, the gap diminishes substantially the longer immigrants remain in the country. Borjas and Trejo (1991) also used pooled data and found that in 1970 recent immigrants were less likely to access SA compared to the native-born; however, this pattern was reversed by 1990 so that recent immigrants, and especially refugees, were more likely than were native-born persons to be receiving SA. As well, the trend in usage was increasing over time. Borjas and Hilton (1996) found that immigrants and the domestic-born were each about equally likely to access cash benefits under SA but immigrants were more likely to access non-cash benefits such as food stamps and housing benefits.

Overall, the U.S. evidence on immigrants accessing transfer programs is more mixed although it tends to suggest they assimilate into accessing them more often the longer they remain in the country and that more recent cohorts accessed them more often. The contrast between Canada where immigrants tend to access transfer programs less and the US where the evidence is more mixed could be due to the fact that the Canadian immigration system emphasizes skills while the US one is built more on family reunification.

Evidence on Impact on Use of Domestic Health Services

A small number of Canadian studies also examine the health status of immigrants and their usage of the health care system compared to Canadians.[8] Those studies generally find that immigrants and non-immigrants are fairly similar in health status (if anything immigrants may be slightly more healthy) and in their use of the health care system. As stated by Laroche (2000. p. 69, 70): "Immigrants' and non-immigrants' health status and use of health care services are, overall, not significantly different… Canada's immigrant population is more or less as healthy as the average native-born Canadian and will use, on average, similar amounts of health services."

Evidence on Impact on Net Fiscal Balance

As indicated previously, immigrants not only access transfer payments and public services but they also contribute to taxes and they share in the cost of public goods. As such, their impact on net fiscal balances (expenditures minus taxes) is ultimately an empirical proposition.

[8] Canadian studies on health status and use of the health-care system in Canada include Chen et al. (1996), Laroche (2000) and Wen et. al. (1996).

Based on the methodology of inter-generational accounting, Collado and Iturbe-Ormaetxe (2004) find that increased immigration would substantially improve the government fiscal balance in Spain, while more modest positive effects are found for Germany in Bonin et al. (2000). These positive effects for those countries largely reflect their large portions of older persons who are associated with substantial pension and health care expenditures, and the smaller portions that are in the tax paying years of their life-cycle. Immigrants, in contrast, are more often in the tax paying years of their lifecycle.

For New Zealand, Slack, Wu and Nana (2007) also estimate a positive net fiscal impact from immigration, with that positive impact trending upwards over time and increasing with the duration of residence of immigrants, in part because they move to higher paying occupations and therefore pay higher taxes and draw less on unemployment insurance or other transfers. They indicate that their results confirm earlier ones for New Zealand. Based on a Computable General Equilibrium model, the New Zealand Department of Labour (2009) also finds a net positive impact. The model also found other positive effects: reduced production costs; increased competitiveness that boosts exports; increased investment and consumer spending; and increased GDP and GDP per capita.

Kirder (2010) estimates the net fiscal impact if immigrants to Germany when return migration is an endogenous choice and when account is taken of the select characteristics of return migrants. He finds large positive net fiscal impacts suggesting that other studies, none of which account for such return migration and its selection bias, substantially underestimate the positive net effects of immigrants on the net fiscal balance. This is so because return migrants contribute to the system when in Germany but do not receive substantial transfers associated with the pension system because they leave. Furthermore, return migrants are a select group in terms of having otherwise high unemployment rates whereby they would draw from the unemployment insurance system. Whether these generalizations for Germany, which has high return migration, would apply to other countries is an open and interesting question. They do suggest, however, that the common practice of not accounting for return migration can underestimate the positive contribution of immigrants to the net fiscal balance.

For the U.S., Lee and Miller (2000), Smith and Edmonston (1996) and Storesletten (2000) also generally find positive effects on government balances with the effects greatest for immigrants who are young or middle-aged and higher skilled. Based on an inter-generational accounting methodology, Auerbach and Oreopoulos (2000) find the net effects of immigration for the U.S. fiscal balance to be fairly small, although it would improve that balance if there was a shift to more educated and skilled immigrants.

Based on Canadian data and a life-cycle model, Akbari (1989a, 1989b 1991, 1995) also find that immigrants are generally associated with positively contributing to the net fiscal balance in Canada, and this applies to immigrants from third-world countries as well.

Because they often enter in the tax-paying years of their life cycle, immigration has often been touted as a potential source of funds to help pay for the looming future expenditures associated with pay-as-you-go systems like public pensions and health care – expenditures that will increase dramatically because of the ageing population. The Canadian evidence, however, suggests that immigration in any feasible amounts will not change the age structure of the Canadian population sufficiently to substantially mitigate such expenditures.[9]

Overall, the evidence for Canada suggests that immigration is likely to have a positive effect on government fiscal balances although that impact is not likely to be sufficient to be a panacea for the looming pension and especially health care expenditures associated with an ageing population. As a more conservative statement it is the case that immigrants are very unlikely to be a net drain on fiscal balances.

Overall Summary of Micro-Evidence on Impact on Domestic Economy

Overall the existing literature tends to suggest the following broad-brush conclusions on the impact of immigration on the domestic economy:

- International and Canadian evidence suggests that immigrants generally have little or no negative impact on *labour market outcomes* such as wages, employment, labour force participation or unemployment. Most studies find no significant impact, with a few finding a negative impact and a few a positive impact.
- Canadian evidence suggests that new immigrants tend to access *transfer programs* like unemployment insurance, social assistance and housing subsidies *less* than do domestic-born persons. The evidence is mixed as to whether they assimilate into using them more the longer they remain in Canada and whether more recent cohorts of immigrants tend to access such programs more often, although the more recent and comprehensive evidence suggests that these latter two effects do not occur.
- Limited Canadian evidence suggests that immigrants and non-immigrants are fairly similar in *health status* (if anything immigrants may be slightly more healthy since most pass a health test) and in their use of the health care system.
- Canadian evidence suggests that immigration is likely to have a small positive effect on government fiscal balances although that impact is not likely to be sufficient to be a panacea for the looming pension and especially health care expenditures associated with an ageing population. As a more conservative statement it is the case that immigrants are very unlikely to be a net drain on fiscal balances.

[9] Canadian evidence that immigration will not substantially change the age structure is provided in Guillimette and Robson (2006) and Sweetman and Warman (2008, p. 28). The latter study concludes (p. 28) that "Overall, there may be an economic benefit from the changing age distribution [from immigration], but the magnitude is extremely modest."

THE FOCUS MACROECONOMETRIC MODEL

In their comprehensive meta-analysis Longhi, Nijkamp and Poot (2008, p. 1) state: "Economic theory alone cannot give a decisive answer about the expected impact of immigration on the labour market. Careful empirical research is needed because an influx of migrants triggers a range of responses from local employers, housing and other markets, native-born and earlier-immigrant households, investors, the public sector, etc." At the end of their analysis, they further conclude (p. 25): "The present paper [their meta-analysis of the literature] has said nothing about the speed of adjustment of the labour market. The long-run impact, that also involves a change in the level of new investment, is likely to be quite different from the impact in the short-run. The effect of immigration on gross fixed capital formation is presently still an under-researched topic… Furthermore, we have also not considered the literature on the impact of immigration on prices… In addition it would be particularly fruitful for future research to shift attention to dynamic aspects of the labour market … Such study of the ways in which the 'churning' in the labour market and the productivity of firms are influenced by changes in immigration levels offers much promise for new primary research."

The purpose of the remainder of this paper is to follow the spirit of those suggestions by providing illustrative evidence of the impact of immigration on the Canadian economy through simulations based on the FOCUS model for the Canadian economy, developed by the Policy and Economic Analysis Program at the University of Toronto. The main outcomes of interest include: real GDP and GDP per capita; unemployment; aggregate demand - especially for housing; investment; productivity; and government expenditures, taxes and net government balances.

Prior to providing the evidence, some of the technical issues, assumptions and related adjustments used to obtain the simulations are discussed. These more technical issues can be skipped by those more interested in just the "bottom-line" results.

TECHNICAL ISSUES, ASSUMPTIONS AND RELATED ADJUSTMENTS

The technical issues and assumptions involved additional changes or adjustments associated with the changes in the immigration levels. These required obtaining additional information related to the immigrants in such areas as: their labour force participation; the full-employment unemployment rate; associated expenditures on government services and infrastructure; government transfer expenditures at the federal, provincial and local levels; remittances and funds brought by immigrants; and the wages of immigrants relative to Canadian-born workers.

Base Case

The simulations are done on a base-case or 'business as usual' projection for the Canadian economy developed by the Policy and Economic Analysis Program in April 2010. The base case covers the period 2012-2021. While it does not affect the simulation results materially, it is worth noting that immigration in the base case is set at approximately 0.75% of population, rising from 260,700 in 2012 to 291,800 in 2021.

Generally, in an impact simulation in a macro-econometric model, the exact nature of the base case has little effect on the impact simulation results. In the base case used here the key features are that the economy has closed much of the output gap opened in the 2008-09 recession by 2012 (which is why we start the simulations then) and continues its recovery thereafter reaching (roughly) 'full employment' by about 2015, and remaining on its potential growth path at full employment through 2021. During this period the federal and provincial fiscal deficits are gradually eliminated, although no major surpluses emerge.

The 'Shock' or Experiment

We model the impact of an increase of 100,000 additional immigrants per year above base-case levels, with the increase occurring in each of the years 2012 through 2021. The increase is the same in each of the years (i.e., 100,000 in 2012, 100,000 in 2013) so that it amounts to one million new immigrants over the 10 year period. The increase we model is strictly for permanent new immigrants; we make no allowance for return migration, and we do not consider the impact of additional immigration through the Temporary Foreign Worker program.

Since the model tends to behave linearly at least within the range of reasonable size "shocks" then other impacts can be predicted in a straightforward fashion. For example, the impact of an alternative simulation involving only 50,000 additional immigrants each year would be approximately half of that of the 100,000 simulation. While the results could be considered 'linear' for an increase of perhaps up to 100,000, or even a decrease of say 30,000, any larger changes in immigration in either direction would likely require further research into important additional effects – for example, the absorptive capacity of the economy for a large increase, or the impact of key labour-shortage bottlenecks for significant decreases in immigration from current levels.

While a rapid increase of immigration by 100,000 per year might not seem completely realistic, it is a number that is consistent with having annual immigration equal to one percent of the Canadian population. That figure has been mentioned as a long-term goal for Canada by the former Citizenship and Immigration Minister Elinor Kaplan and more recently re-iterated by the current Official Opposition Critic for Youth, Citizenship and Immigration, Justin Trudeau.

The 100,000 per year are distributed by gender and individual ages using the average distribution of immigrants for the last three years available to us (that is, for the population periods covering July 1-June 30 for 2006-7, 2007-8 and 2008-9). The assumed additional immigrants are 'aged' each year, with the changes in total population, and in the source populations by gender and age that enter the FOCUS model all calculated in an external spreadsheet.

For the present experiment we have assumed no increases in births or deaths from the additional immigration. Over a ten-year horizon, children born to new immigrants would not be entering the workforce, and losses to the workforce would likely be very small from mortality.

Additional Model Changes or Adjustments

Many additional adjustments or inputs to the model are required to represent accurately the desired change in the level of immigration. These are discussed below:

Participation Rates

Participation rates are determined endogenously in the model for each gender and for the age categories 15-19, 20-24, 25-54, 55-64 and 65+. We needed to adjust the inputs to these equations to reflect the fact that the increases in the source populations were all immigrants. Data were used to determine the participation rate behaviors of 'very recent' (0-5 years) and 'recent' (6-10 years) immigrants relative to the average source population, by the gender and age categories above. Adjustments were then made to the participation rate equations of the model to reflect the alternative participation rate behaviors of immigrants. It was assumed that any 'discouraged' (or 'encouraged') worker responses to changes in employment conditions would be the same for both base-case and new immigrant workers.

Full-Employment Unemployment Rate

The full-employment or 'natural' unemployment rate or 'Non-Accelerating Inflation Rate of Unemployment' (NAIRU) is a key exogenous variable in the FOCUS model. After consideration of the literature we determined that new immigrants, on average, would not change the overall national NAIRU – that is, that their natural rate of unemployment would be no different from that of the average Canadian source population.

There is one additional model change made in relation to the NAIRU: In the consumption and housing demand equations of FOCUS the difference between the actual unemployment rate and the NAIRU is used as a 'signal' or proxy for the perceived cyclical state of the economy. (It is a significant variable in the equation regressions in

each case.) In the simulations we have 'turned off' this factor, such that, for example, an increase in the actual rate of unemployment relative to the NAIRU simply because there are additional immigrants who are initially unemployed is *not* taken as an overall sign of cyclical weakness in the economy leading to a reduction of consumption or housing demand. As it happens, the final simulations show little impact on the actual rate of unemployment, so the impact of this change in the model is likely very small.

Government Spending

Real government current and capital spending (as opposed to transfers or interest on the debt, etc.) are exogenous in real terms in FOCUS. Nonetheless, it is clear that all government levels to some extent spend on both current and capital items on a 'per capita' basis and that a significant increase in the population will almost certainly lead to some increase in expenditures for government services and the building of government infrastructure.

There is little guidance from the literature on this issue so we assume that real current and capital spending by level of government will change in proportion to the increase in overall population due to increased immigration with the proportions being 0.5 for federal, and 0.75 for provincial and local governments. That is, if the national population in a year is, say, 1% higher due to the cumulative effects of increased immigration, then federal real current and capital expenditures will be 0.5% higher, and provincial and municipal expenditures 0.75% higher. Since these proportions are each less than 1.0, we are assuming that there are 'economies of scale' in the provision of government services – although less so at the provincial and local level than at the federal level.

Implicit in these expenditure increases will also be any increased expenditures directly related to servicing immigrants – for example, second language classes, immigration processing, and other settlement expenditures. Data on these expenditures are difficult to pin down and, in any case, they are likely to be dwarfed by increases in expenditures for basics like health care, education and municipal services that must be provided for any increase in population.

Government transfer expenditures were reviewed on an item-by-item basis and adjusted as follows:

Federal:

. OAS and GIS: The FOCUS equation depends on the number of people 65+, but to obtain OAS or GIS requires residency of 10 years; therefore the impact of immigration was removed from this equation.

. GST credit and child benefit: The impact of immigration on these equations was lagged by one year to reflect the impact of settling in and filing the necessary applications.

. Other non-taxable transfers: These transfers go largely to non-immigrants (veterans, First Nations) so the effect of increased population was removed from this equation.

. Universal Child Care Benefit: This is normally treated as exogenous in the model as the program is very new. The number of new immigrants aged 0-5 was separately entered in the model and $1200 per child paid out, with a lag of one year.

. Employment Insurance Payments: Using data from 2007 from the Employment Insurance Monitoring and Assessment Report, the relative usage of EI by immigrants (by year since immigration) relative to the total of all tax filers could be determined. These ratios were used to adjust EI payments to immigrants as they accumulated over the ten-year simulation.

Provincial:

. Workers Compensation (WC): No change was made in the model since this equation is function of total source population. Immigrant workers would be covered and could draw upon WC as soon as they began work.

. Social Assistance (SA): SA is a function of total population and of the number of unemployed. The population increase due to immigration is lagged one year to reflect time to access and use social assistance.

. Other non-taxable Transfers: This item includes provincial transfers to non-profits (like Childrens' Aid) and is a function of population. The population increase due to immigration is lagged one year to reflect adjustment times.

Local:

. Transfers to Persons: This is largely welfare but may include additional old age transfers in some provinces (like Ontario) and is a function of population. The population increase due to immigration is lagged one year to reflect adjustment times.

Canada and Quebec Pension Plan:

.With the ten-year horizon of the simulation very few immigrants would qualify for CPP/QPP. The effect of the increase in population 65+ was therefore removed from this equation.

Remittances and Funds Brought by Immigrants

Immigrants both bring funds with them to the country (one-time, as they come) and then make remittances outside the country on an ongoing basis. There are two variables in the FOCUS model that include these terms and that need to be adjusted to reflect the impact of additional immigration.

Funds brought by immigrants: These funds not only go through the Balance of Payments but also add to personal income so they are there to assist spending. Based on external information on average saving by 'household' in the 25-64 age range, the funds brought by immigrants in 2009 (in 2009 prices) would have been about $1.1 billion for 100,000 immigrants. Since 100,000 immigrants would have been about 39.7% of total

immigrants in 2009, the implication is that immigrants in 2009 actually brought with them about $2.8 billion. This basic figure of $1.1 billion is extended in nominal terms for 2012-2021 and those are the numbers that went into the simulation model.

Remittances by Immigrants – this is a component, but my no means even the majority, of the Balance of Payments item called 'transfers from persons to non-residents', which includes private pensions paid to Canadians abroad, and all private foreign aid out-payments. A Statistics Canada study by Houle and Schellenberg (2008) gives information on this, extracted from the Longitudinal Survey of Immigrants to Canada. They point out, however, that it is likely to be an underestimate, in part because only one randomly-selected member of each household unit was in the survey.

Based on this source , we assume $15 million nominal remittances for each annual new immigrant cohort for their first two years in Canada, and $20 million for the remaining years. These will, of course, cumulate, so that by the 10^{th} year our 1 million new immigrants are sending $190 million abroad. Interestingly, these funds are dwarfed by the annual inflow brought by the new immigrants.

Wages and GDP Impact of Immigrants vs. Domestic Workers

As indicated, while immigrants tend to be more skilled than the average Canadian worker, they often have lower wages, with their skill sets presumably under-used. To account for this in the simulations we have done the following:

1) Using special calculations from the 2006 census, we determined that the ratio of earnings for recent male immigrant workers (came within one year) vs. the sum of all male workers was 0.661, or, put alternatively, that male immigrant workers who entered within one year of the census earned 33.9% less than all male workers in the census year. For females the corresponding ratio was 0.732. We use these ratios, and the shares of male and female new labour-force participants from immigration, to adjust the wages received by new immigrants in the simulations.

2) The 'penalty' on immigrants adjusts over time. Based on past and ongoing studies, the earnings differential between immigrants and domestic workers is reduced by one percentage point per year for both males and females. Each cohort is adjusted as the simulation extends out the ten years. Still, by the end of the tenth year even the first cohort of male immigrants is earning about 23% less than the average of domestic male employed persons.

3) The wage differential is assumed to indicate an equivalent productivity differential reflecting such factors as the underutilization of immigrant skills that would otherwise make them more productive (and earn a higher wage) or the inability to apply these greater skills, especially when they first enter, because of language, cultural or other barriers. As indicated, this differential falls by one percentage point for each year in Canada.

SIMULATION RESULTS

The major results from the simulation are divided according to the following categories: economic growth and per capita income; labour market variables; financial variables; and fiscal impacts. Table 1 gives the results based on the assumption that the ratio of immigrant/domestic wages reflects the ratio of their productivity reflecting the lower utilization of immigrant skills; Table 2 assumes that new immigrants are paid and have the same marginal product as domestic or 'base-case' workers.

Economic Growth and Per Capita Income

Not surprisingly, the result of a larger population due to increased immigration is a larger Canadian economy. Relative to the base case, real GDP is estimated to be 2.3% larger in 2021. In constant (2002) dollar terms, real GDP is larger in 2021 by $39.7 billions. However, the percentage impact on real GDP of an increase in immigration is somewhat less than the percentage impact on population. Specifically, after 10 years, total population has increased by 2.6% given an increase in immigration of 100,000 per year; therefore, GDP on a per capita basis has fallen by roughly 0.3%. We also estimate that it would be higher than it otherwise would be in all of the intervening years as well but, of course, by smaller amounts. The fall in real GDP *per capita* occurs largely because of our assumption that immigrants are initially paid below their marginal productivity and recent cohorts only slowly assimilate into the labour market. In a variant simulation (discussed below) where we assume immigrants earn and contribute to GDP at the same rate as the domestic workforce, real GDP per capita increases.

On a year-by-year basis, real per capita income first rises slightly above the base-case, then falls below it and then, by the last year, is still below the base-case but less so than in the middle years of the simulation. This rather complex pattern is the result of several processes. First, the initial surge in aggregate demand brought by new immigrants causes a temporary increase in productivity as the model's econometric employment equation shows a clear lag the in the response of employment to an increase in production. That is, for a year or two after a demand surge, all else equal, some new labour is hired, but the existing work force also works more intensively, yielding a temporary increase in productivity (and therefore in GDP per capita). As this process fades (that is, employment catches up with output) then our assumed lower level of productivity for new immigrants takes full effect (and the number of new immigrants relative to the base case population is growing) so that a loss of average productivity and real GDP per capita is evident. However, at the same time there is an underlying build up of the capital stock that is occurring, and a shift in the components of demand, both of which increase the productivity of the domestic or base-case work force and of the new immigrant workforce. (It is impossible to say how much of this improvement goes to each group). By the tenth year of the simulation, real GDP per capita is still below base, but *less* below base than would be true if only the lower productivity level of new immigrants was all that was happening. (If we assume that none of the additional productivity improvement accrues to the new immigrant work force, then we can calculate that by 2010 GDP for the base-case population increases by $6.5 billion (2002

dollars) or that real per capita income of the base-case population has increased by 0.37% -- a far-from-negligible increase and considerable benefit to the existing population when the positive impacts on government balances discussed below are also added in.)

With respect to the components of GDP, the impact on personal consumption is slightly lower than that on overall GDP. The same is true for government current and capital expenditures, which we have assumed do not increase at the same per capita rate for additional immigrants as the overall per capita government expenditure in the economy in the base case. Where there is a pronounced surge in aggregate demand is of course in housing, and, perhaps surprisingly, in non-residential and machinery-and-equipment investment. These last two are stimulated by the overall growth in the economy and by a positive impact on corporate profits, which tend to expand in advance of the overall economy. The economy generates additional new capital for the immigrants to work with by an almost automatic process, while of course the stimulus to provide additional housing is an important addition to aggregate demand. It is also the case in the Canadian economy that workers in the investment sector -- both residential and nonresidential -- are somewhat more productive, on average, than those in the consumer sector; therefore the shift to investment production that occurs because of additional immigration adds to overall economy wide productivity.

Labour Market Variables

The increase in immigration of 100,000 per year leads to an increase in the working-age population (i.e., 15+) of 852,000 in 2021 (relative to the base case). This 2.7% rise in the working-age population leads to a similar rise in the size of the labour force (i.e., 2.7% in 2021 or about 553,000).

An increase in immigration could lead, at least temporarily, to an increase in unemployment as immigrants enter the labour market and search for employment. However, immigration increases the demand for the goods and services in an economy (e.g., housing) both directly to satisfy immigrants' needs and indirectly through the provision of government services. In addition, any tendency to increase unemployment will put downward pressures on real wages, which will also help clear the labor market.

The results of our central simulation are fairly clear on this conjecture: there is virtually no impact on the unemployment rate from additional immigration -- indeed in the early part of the simulation there is a slight decrease. What this means, primarily, is that the influx of immigrants is adding sufficiently to demand in the Canadian economy that their increase in labour supply finds a ready market and leads to almost no disruption of the overall labor market. In levels terms, by the tenth year of the simulation the employment level is found to increase by 2.8% (539,000 jobs), which is slightly higher in percentage terms than the projected increase in the labour force (increases by 2.7% or 553,000 potential workers), leaving roughly the base-case proportion of unemployed (and recalling our assumption that the full-employment unemployment rate or NAIRU is approximately the same for both new immigrants and the base-case labour force.

Financial Variables

The Bank of Canada is assumed to respond to the immigration increase by maintaining (approximately) the base-case inflation path (which is set to the Bank's 2% inflation target). At the same time, however, the Bank must increase monetary aggregates, because the underlying potential growth path of the economy is increased by the additional immigration.

In the resulting simulation, the CPI inflation rate stays very close to base, falling slightly below it in the first two years of the simulation and rising slightly above it (the maximum is 0.09 per cent in 2015) in subsequent years. After ten years, the CPI price level is only 0.18% above base. (Note that the lower earnings of new immigrants do not translate into potentially lower inflation in this case since we have also assumed that these lower earnings reflect lower productivity reflecting the underutilization of their substantial skills – that is, unit labour costs do not change.) To obtain this inflation path, the Bank must adjust short-term interest rates – first slightly below base and then to a maximum of 30 basis points above base. Despite slightly higher interest rates, the opportunities for new investment in machinery and in new non-residential structures is such that these still increase considerably, as noted above.

The exchange rate is subject to mixed pressures: Immigrants' funds brought into Canada would otherwise appreciate the dollar, but as remittances build these are partly offset. There is also a surge in aggregate demand that increases on imports, and this is especially the case as machinery investment expands since the majority of such investment is imported. In the final years of the simulation the exchange rate is clearly, but modestly, depreciating (by about 2% relative to base) and there is a negative impact on the Current Account of the Balance of Payments in virtually every year of the simulation.

Fiscal Impacts

While governments increase their expenditures in response to new immigration, many other government expenditures do not increase to the same extent. This is the case, for example, for expenditures for the Old Age Security (OAS) pension and the Canada Pension Plan (CPP). Taxes and CPP contributions are increased as the new immigrants begin work, but for some programs it takes a long time for the corresponding expenditures to take effect. Moreover there are overall economies of scale in the provision of government services that mean that an expansion of GDP, even if it is not an expansion in GDP per capita, still adds to the overall government balances. By the 10th year of the simulation overall government balances have increased by $14 billion above the base case (and by roughly $8 billion at the federal level). This represents a significant reserve against future needs or could perhaps be redeployed into additional social programs or tax cuts.

Alternative Simulation

In the alternative simulation (Table 2) we assume that new immigrants are paid and have the same marginal product as domestic or 'base-case' workers. While this may be a somewhat heroic assumption given the evidence on the slow economic assimilation of immigrants, its purpose is to indicate what gains could be had from integrating immigrants more quickly and fully into the economy or finding immigrants who can be more quickly integrated. In this case, while the population after 10 years is again 2.6% higher than in the base case, real GDP is over 3.4% higher and there is a net gain in productivity from accumulation of new capital and the reorientation of output in the economy to investment goods and to exports. In the last year of the simulation the overall government balances are $22 billion higher than in the base case. Once again, there is virtually no negative impact on the unemployment rate as the demand directly or indirectly associated with new immigrants meets their addition to the potential supply capacity of the economy.

SUMMARY AND POLICY DISCUSSION

If immigration has a negative impact on the Canadian economy this could foster a backlash against immigration that would fuel the concerns that already exist on the part of immigrants because of their increasingly slow rate of economic assimilation into the Canadian economy and their associated increase in poverty. In essence, both Canadians and immigrants themselves would have reason for discontent. This paper reviews the literature on the impact of immigration and uses the FOCUS model for the Canadian economy to simulate the impact of additional immigration.

The theoretical literature highlights that immigration can have a complex and indeterminate impact on various dimensions of the domestic labour market, including wages, employment, labour force participation and unemployment. The same is the case for various other outcomes such as the net fiscal balance (government expenditures including transfer payments less taxes). As such it is necessary, as is so often the case for evidence-based policy making, to appeal to the empirical evidence.

The international evidence on the impact of immigration on the *domestic labour market* tends to be mixed, although a simple score-card count would show most studies finding little or no impact, a few finding a positive impact and a few a negative impact. Certainly, the evidence tends not to show any substantial negative impact. This is also the case for Canada, although the evidence is not uniformly in agreement.

The Canadian evidence suggests that new immigrants tend to access *transfer programs* like unemployment insurance, social assistance and housing subsidies less than do domestic-born persons. The evidence is mixed as to whether they assimilate into using them more the longer they remain in Canada and whether more recent cohorts of immigrants tend to access such programs more often, although the more recent and

comprehensive evidence suggests that these latter two effects do not occur. Not surprisingly, accessing of transfer programs by immigrants is higher for the less skilled and it varies by immigrant class in descending order from high to low usage being refugees, family class, assisted relatives, skilled workers and business class.

The U.S. evidence on immigrants accessing transfer programs is more mixed although it tends to suggest they assimilate into accessing them more often the longer they remain in the country and that more recent cohorts accessed them more often. The contrast between Canada where immigrants tend to access transfer programs less and the US where the evidence is more mixed could be due to the fact that the Canadian immigration system emphasizes skills while the US one is built more on family reunification.

Limited Canadian evidence suggests that immigrants and non-immigrants are fairly similar in health status (if anything immigrants may be slightly more healthy) and in their use of the *health care* system.

Canadian evidence suggests that immigration is likely to have a small positive effect on *government fiscal balances* (expenditures including transfers less taxes) although that impact is not likely to be sufficient to be a panacea for the looming pension and especially health care expenditures associated with an ageing population. As a more conservative statement it is the case that immigrants are very unlikely to be a net drain on fiscal balances.

The existing literature identified a gap in our knowledge on the impact of immigration because the micro-analysis studies often do not account of such factors as responses from employers, housing and other markets, public expenditure, taxes, prices and longer run dynamic adjustments not only in the labour market but in other markets. This paper follows the spirit of those suggestions by providing illustrative evidence of the impact of immigration on the Canadian economy through simulations based on the FOCUS model for the Canadian economy, developed by the Policy and Economic Analysis Program at the University of Toronto. The main outcomes of interest include: real GDP and GDP per capita; unemployment; aggregate demand and especially for housing; investment; productivity; and government expenditures, taxes and net government balances.

We simulate the expected impact of additional immigration into Canada over the period 2012-2021. The model is modified to incorporate additional information related to the immigrants in such areas as: their labour force participation; the full-employment unemployment rate; associated expenditures on government services and infrastructure; government transfer expenditures at the federal, provincial and local levels; remittances and funds brought by immigrants; and the wages of immigrants relative to Canadian-born workers.

Our illustrative projections are based on an assumed increase of 100,000 *additional* immigrants per year above base-case levels, with the increase being the same

in each of the years 2012 through 2021 (i.e., 100,000 in 2012, 100,000 in 2013) so that it amounts to one million new immigrants over the 10 year period. Alternative assumptions within a reasonable range around this figure would yield roughly proportionate projections (e.g., 50,000 additional immigrants each year would have the effect of approximately half of that of the 100,000 simulation).

The following are some results:

- Real GDP increases by 2.3% by 2021, the end of the 10-year simulation period

- Population increases by 2.6% because of the additional one million immigrants over the period, so that real GDP *per capita* falls slightly. This occurs largely because of assumptions we have incorporated (that are relaxed in later simulations) reflecting the fact that immigrants are initially paid below the level of the domestic or 'base-case' workforce and recent cohorts only slowly assimilate into the labour market (based on evidence from the literature).

- Unemployment is not affected, reflecting the fact that immigrants increase aggregate demand for goods and services (especially housing) and this roughly offsets any increase in unemployment as they enter the labour market and search for employment.

- The initial increase in aggregate demand comes mainly from housing and consumption. In later years it also comes from an increase in non-residential and machinery-and-equipment investment, stimulated by various factors:
  - the overall growth in the economy
  - the generation of new capital to work with the new immigrants
  - the positive impact on corporate profits, which tend to expand in advance of the overall economy.

- Productivity for both domestic workers and new immigrants is increased because of the increase in investment relative to consumption and the fact that the average workers in the investment sector (residential and nonresidential) are somewhat more productive than those in the consumer sector. This effect partly, but only partly, offsets the assumed lower productivity of new immigrant workers as they are not placed on jobs commensurate with their skills.

- Governments' expenditures increase in response to new immigration (although some like OAS and CPP only by a small amount and with a long lag). Taxes and CPP contributions increase sooner as the new immigrants begin work. The increase in expenditures is less than the increase in taxes paid by immigrants since:
  - The taxes are more immediate while many of the expenditures come later
  - There are economies of scale in the provision of government services
  - Immigrants tend to enter in the tax paying years of their lifecycle

- Because taxes paid by immigrants exceed expenditures, immigration adds to overall government balances (i.e., by $14 billion in total and by roughly $8 billion at the federal level by the 10th year of the simulation). This represents a significant reserve against future needs or could perhaps be redeployed into additional social programs or tax cuts.

- In the alternative simulation, we assume that new immigrants earn and contribute to GDP at the same rate as the base-case work force The purpose of this simulation is to indicate what gains could be had from integrating immigrants more quickly and fully into the economy or finding immigrants who can be more quickly integrated. In this case, after 10 years:
  - Real GDP growth is greater than population growth so that real GDP per capita increases
  - There is a greater net gain in productivity from accumulation of new capital and the reorientation of output in the economy to investment goods and to net exports
  - Government balances are $22 billion higher than in the base case
  - Again, there is no negative impact on the unemployment rate as the demand directly or indirectly associated with new immigrants meets their addition to the potential supply capacity of the economy

With respect to avenues for further research, some potential work includes estimating models that capture regional aspects to Canada's immigration flows and that incorporate salient labour market differences between immigrants according to their landing categories. Including these aspects in an internally-consistent macro-econometric modeling framework would further augment the evidence-based used for formulating immigration policy.

The main policy implication that flows from our simulations is that additional immigration is likely to have a positive impact on the Canadian labour market and economy in general, including net fiscal balances. This is generally buttressed by conclusions reached in the existing literature; however, that literature is by no means in agreement.

The real concern, however, is with respect to immigrants themselves in that they appear to be having an increasingly difficult time economically assimilating into the Canadian labour market, and new immigrants are increasingly falling into poverty. Furthermore, existing immigrants are likely to be adversely affected by expanding immigration since new and existing immigrants are likely substitutes. Improving the economic integration of immigrants into the Canadian labour market is likely to be beneficial not only for the immigrants themselves but also because such integration is also likely to enhance the generally positive impact that immigrants have on the Canadian economy.

Appendix 1. List of Knowledge Transfer Presentations

Dungan, P, Fang, T, and Gunderson M. 2010. "The Macroeconomic Impact of Canadian Immigration: An Empirical Analysis Using the FOCUS Model." Paper presented at the Citizenship and Immigration Canada Research Network Meeting, October 26, Ottawa, Ontario.

Dungan, P, Fang, T, and Gunderson M. 2010. "The Macroeconomic Impact of Canadian Immigration: An Empirical Analysis Using the FOCUS Model." Paper presented at the CERIS Research Seminar, October 22, Toronto, Ontario.

Dungan, P, Fang, T, and Gunderson M. 2010. "The Macroeconomic Impact of Canadian Immigration: An Empirical Analysis Using the FOCUS Model." Paper presented at the Conference on the Economics of Immigration, October 29-30, Ottawa, Ontario.

Dungan, P, Fang, T, and Gunderson M. 2010. "The Macroeconomic Impact of Canadian Immigration: An Empirical Analysis Using the FOCUS Model." Paper to be presented at the Rotman Institute for International Business Roundtable, University of Toronto, December 1, Toronto, Ontario.

Dungan, P, Fang, T, and Gunderson M. 2011. "The Macroeconomic Impact of Canadian Immigration: An Empirical Analysis Using the FOCUS Model." Paper to be presented at The 2011 National Metropolis Conference, March 23-26, Vancouver, British Columbia.

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TABLES

TABLE 1: FOCUS MODEL - Policy and Economic Analysis Program

Immigration + 100,000/year; *Using Census 2006 Wage Ratios for Immigration Wage/Productivity*

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Real Gross Domestic Product	0.43	0.87	0.89	0.79	0.92	1.21	1.40	1.61	2.00	2.29
Real Gross National Product	0.43	0.87	0.85	0.65	0.72	1.03	1.28	1.53	1.97	2.34
Expenditure on Personal Consumption	0.31	0.62	0.90	1.06	1.13	1.19	1.30	1.45	1.64	1.86
Expenditure by Governments	0.16	0.32	0.46	0.61	0.77	0.92	1.06	1.20	1.34	1.46
Investment Expenditure	1.21	2.45	2.20	1.56	2.02	3.17	3.71	3.86	4.40	4.70
Residential Construction	2.48	4.65	4.69	5.00	6.90	8.74	9.14	9.46	10.45	10.47
Non-Residential Construction	0.34	0.83	0.56	-0.04	0.02	0.65	1.10	1.34	1.77	2.12
Machinery and Equipment	0.50	1.48	1.08	-0.54	-1.06	0.10	1.11	1.13	1.44	2.15
Exports	0.02	0.08	0.10	0.04	-0.07	-0.13	-0.07	0.11	0.35	0.60
Imports	0.13	0.36	0.65	0.82	0.89	0.97	1.02	0.93	0.81	0.84
Gross Domestic Product	0.39	0.79	0.87	0.87	1.08	1.41	1.67	1.92	2.30	2.62
Implicit Deflator for GDP	-0.05	-0.08	-0.02	0.08	0.16	0.20	0.26	0.30	0.30	0.33
GDP Deflator - Inflation Rate *	-0.05	-0.04	0.06	0.11	0.08	0.05	0.06	0.04	0.00	0.03
Total Population ('000) *	100	200	300	400	500	600	700	800	900	1000
Total Population	0.29	0.57	0.84	1.11	1.37	1.63	1.87	2.12	2.35	2.59
Source Population ('000) *	79	159	241	324	409	495	582	670	761	852
Source Population	0.28	0.56	0.83	1.10	1.38	1.65	1.92	2.19	2.46	2.73
Unemployment Rate *	-0.06	-0.19	-0.18	-0.05	0.02	0.00	0.00	0.00	-0.05	-0.09
Employment	0.34	0.80	1.08	1.16	1.28	1.54	1.82	2.09	2.45	2.82
Labour Force	0.28	0.59	0.88	1.10	1.30	1.55	1.82	2.10	2.40	2.72
Participation Rate *	0.00	0.02	0.03	0.00	-0.05	-0.07	-0.07	-0.06	-0.04	-0.01
Finance Co. 90-Day Paper Rate *	-0.10	0.03	0.29	0.31	0.14	0.08	0.14	0.09	0.02	0.14
Industrial Bond Rate *	-0.10	0.03	0.30	0.32	0.15	0.08	0.15	0.10	0.02	0.14
Consumer Price Index	-0.05	-0.10	-0.07	0.02	0.07	0.10	0.14	0.17	0.17	0.18
CPI - Inflation Rate *	-0.05	-0.05	0.04	0.09	0.05	0.03	0.05	0.03	-0.01	0.02
Average Annual Wages and Salaries	-0.08	-0.08	-0.04	-0.03	-0.04	-0.07	-0.10	-0.14	-0.15	-0.12
Real Annual Wages per Employee	-0.02	0.02	0.02	-0.05	-0.11	-0.17	-0.24	-0.31	-0.31	-0.30
Productivity Change (GDP/Employee)	0.09	0.06	-0.19	-0.37	-0.36	-0.33	-0.42	-0.48	-0.46	-0.53
Exchange Rate (US $/Cdn $)	-0.12	-0.28	-0.05	0.27	0.37	0.10	-0.40	-1.05	-1.65	-2.02
Balance on Current Account ($ Mill) *	283	-1457	-3095	-4221	-5681	-7795	-9339	-8847	-7435	-6933
Consolidated Government Balance ($ Mill) *	2211	4662	5237	4768	5111	6395	7490	8924	11744	14313
Federal Gov't Balance (NA Basis) ($ Mill) *	1282	2591	2734	2399	2751	3706	4492	5458	7238	8804
Ratio: Federal Debt to GDP (%) *	-0.2	-0.4	-0.6	-0.7	-0.8	-1.0	-1.2	-1.4	-1.7	-2.0
Prov'l Gov't Balance (NA Basis) ($ Mill) *	811	1721	1986	1802	1748	1934	2067	2362	3127	3774
Ratio: Provincial Debt to GDP (%) *	-0.1	-0.3	-0.4	-0.4	-0.5	-0.7	-0.8	-0.9	-1.0	-1.2
Personal Savings Rate (%) *	0.0	0.0	-0.2	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
Nominal After-Tax Corporate Profits	2.1	3.1	1.9	1.0	2.2	4.1	5.0	5.7	7.1	7.6
Real Personal Disposable Income	0.2	0.5	0.7	0.8	0.8	0.8	0.9	1.0	1.2	1.4

(* Indicates change in levels; otherwise percentage change)

TABLE 2: FOCUS MODEL - Policy and Economic Analysis Program
Immigration + 100,000/year; *Variant assuming NO difference in Immigrant/Domestic Wage/Productivity*

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Real Gross Domestic Product	0.45	1.03	1.34	1.48	1.71	2.03	2.29	2.58	3.02	3.44
Real Gross National Product	0.45	1.05	1.37	1.49	1.70	2.05	2.36	2.70	3.24	3.77
Expenditure on Personal Consumption	0.33	0.68	1.05	1.38	1.64	1.87	2.08	2.29	2.53	2.82
Expenditure by Governments	0.17	0.33	0.48	0.63	0.78	0.93	1.07	1.21	1.35	1.48
Investment Expenditure	1.26	2.89	3.39	3.14	3.31	4.05	4.58	4.96	5.72	6.30
Residential Construction	2.55	5.30	6.20	6.53	7.70	9.13	9.72	10.36	11.52	11.87
Non-Residential Construction	0.36	1.07	1.26	0.94	0.82	1.11	1.41	1.66	2.13	2.57
Machinery and Equipment	0.54	1.87	2.40	1.70	1.24	1.91	2.79	3.18	3.93	5.02
Exports	0.02	0.14	0.30	0.45	0.54	0.62	0.72	0.91	1.18	1.50
Imports	0.13	0.30	0.51	0.65	0.74	0.85	0.95	0.92	0.83	0.84
Gross Domestic Product	0.43	0.94	1.24	1.40	1.64	1.96	2.22	2.48	2.86	3.20
Implicit Deflator for GDP	-0.03	-0.09	-0.10	-0.08	-0.07	-0.07	-0.07	-0.09	-0.16	-0.23
GDP Deflator - Inflation Rate *	-0.03	-0.06	-0.01	0.02	0.01	0.00	0.00	-0.02	-0.07	-0.07
Total Population ('000) *	100	200	300	400	500	600	700	800	900	1000
Total Population	0.29	0.57	0.84	1.11	1.37	1.63	1.87	2.12	2.35	2.59
Source Population ('000) *	79	159	241	324	409	495	582	670	761	852
Source Population	0.28	0.56	0.83	1.10	1.38	1.65	1.92	2.19	2.46	2.73
Unemployment Rate *	0.02	-0.10	-0.15	-0.11	-0.07	-0.05	-0.02	0.01	-0.03	-0.08
Employment	0.23	0.65	1.00	1.21	1.40	1.63	1.87	2.11	2.43	2.81
Labour Force	0.25	0.54	0.84	1.09	1.32	1.58	1.85	2.12	2.40	2.72
Participation Rate *	-0.02	-0.01	0.00	-0.01	-0.04	-0.05	-0.05	-0.05	-0.04	-0.01
Finance Co. 90-Day Paper Rate *	-0.12	-0.12	0.03	0.09	0.01	-0.05	-0.03	-0.11	-0.21	-0.15
Industrial Bond Rate *	-0.13	-0.12	0.03	0.09	0.01	-0.05	-0.03	-0.11	-0.22	-0.15
Consumer Price Index	-0.03	-0.11	-0.15	-0.15	-0.17	-0.20	-0.21	-0.25	-0.32	-0.40
CPI - Inflation Rate *	-0.03	-0.07	-0.04	-0.01	-0.02	-0.03	-0.02	-0.03	-0.08	-0.08
Average Annual Wages and Salaries	-0.02	-0.01	0.05	0.11	0.17	0.20	0.21	0.18	0.16	0.17
Real Annual Wages per Employee	0.01	0.10	0.20	0.27	0.34	0.40	0.42	0.43	0.49	0.57
Productivity Change (GDP/Employee)	0.22	0.37	0.32	0.26	0.30	0.38	0.40	0.44	0.56	0.60
Exchange Rate (US $/Cdn $)	-0.18	-0.68	-0.95	-1.05	-1.14	-1.37	-1.77	-2.38	-3.08	-3.65
Balance on Current Account ($ Mill) *	288	-1113	-1959	-1999	-2102	-2902	-3750	-3185	-1502	47
Consolidated Government Balance ($ Mill) *	2186	5186	7304	8551	9965	11866	13505	15497	18840	22460
Federal Gov't Balance (NA Basis) ($ Mill) *	1246	2886	3910	4439	5187	6290	7234	8403	10382	12442
Ratio: Federal Debt to GDP (%) *	-0.2	-0.5	-0.7	-0.9	-1.2	-1.5	-1.8	-2.1	-2.5	-2.9
Prov'l Gov't Balance (NA Basis) ($ Mill) *	836	1948	2773	3271	3723	4249	4651	5177	6145	7198
Ratio: Provincial Debt to GDP (%) *	-0.1	-0.3	-0.5	-0.6	-0.8	-1.0	-1.2	-1.4	-1.6	-1.9
Personal Savings Rate (%) *	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1
Nominal After-Tax Corporate Profits	2.1	3.8	3.4	2.6	2.8	3.7	4.2	4.8	6.0	6.6
Real Personal Disposable Income	0.3	0.6	0.9	1.2	1.4	1.6	1.8	2.0	2.3	2.6

(* Indicates change in levels; otherwise percentage change)